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UNITED STATES**

1998

NATALITY

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VITAL STATISTICS OF THE UNITED STATES: NATALITY, 1998
TECHNICAL APPENDIX

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A copy of the technical appendix may be obtained by contacting the National Center for Health Statistics, Reproductive Statistics Branch at 301-458-4111.

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Definition of live birth

Every product of conception that gives a sign of life after birth, regardless of the length of the pregnancy, is considered a live birth. This concept is included in the definition set forth by the World Health Organization (1):

Live birth is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered liveborn.

This definition distinguishes in precise terms a live birth from a fetal death (see the section on fetal deaths in the Technical Appendix of volume II, *Vital Statistics of the United States*). In the interest of comparable natality statistics, both the Statistical Commission of the United Nations and the National Center for Health Statistics (NCHS) have adopted this definition (2,3).

History of birth-registration area

The national birth-registration area was proposed in 1850 and established in 1915. By 1933 all 48 States and the District of Columbia were participating in the registration system. The organized territories of Hawaii and Alaska were admitted in 1929 and 1950, respectively; data from these areas were prepared separately until they became States--Alaska in 1959 and Hawaii in 1960. Currently the birth-registration system of the United States covers the 50 States, the District of Columbia, the independent registration area of New York City, Puerto Rico, the U.S. Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Mariana Islands. However, in the statistical tabulations, "United States" refers only to the aggregate of the 50 States (including New York City) and the District of Columbia.

The original birth-registration area of 1915 consisted of 10 States and the District of Columbia. The growth of this area is indicated in table 4-1. This table also presents for each year through 1932 the estimated midyear population of the United States and of those States included in the registration system.

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Because of the growth of the area for which data have been collected and tabulated, a national series of geographically comparable data before 1933 can be obtained only by estimation. Annual estimates of births have been prepared by P. K. Whelpton for 1909-34 (4). These estimates include adjustments for underregistration and for States that were not part of the birth-registration area before 1933.

Sources of data

Nativity statistics

Since 1985 natality statistics for all States and the District of Columbia have been based on information from the total file of records. The information is received on computer data tapes coded by the States and provided to NCHS through the Vital Statistics Cooperative Program. NCHS receives these tapes from the registration offices of all States, the District of Columbia, and New York City. Information for Puerto Rico is also received on computer tapes through the Vital Statistics Cooperative Program. Information for the Virgin Islands and Guam is obtained from microfilm copies of original birth certificates and is based on the total file of records for all years. Data from American Samoa first became available in 1997. Data from the Commonwealth of the Northern Mariana Islands (referred to as Northern Marianas) first became available in 1998. Similar to data from the Virgin Islands and Guam, the data are obtained from microfilm copies of original birth certificates and are based on the total file of records.

Birth statistics for years prior to 1951 and for 1955 are based on the total file of birth records. Statistics for 1951-54, 1956-66, and 1968-71 are based on 50-percent samples except for data for Guam and the Virgin Islands, which are based on all records filed. During the processing of the 1967 data the sampling rate was reduced from 50 percent to 20 percent. For details of this procedure and its consequences for the 1967 data see pages 3-9 to 3-11 in volume I of *Vital Statistics of the United States, 1967*. From 1972 to 1984 statistics are based on all records filed in the States submitting computer tapes and on a 50-percent sample of records in all other States.

Information for years prior to 1970 for Puerto Rico, the Virgin Islands, and Guam is published in the annual vital statistics reports of the Department of Health of the Commonwealth of Puerto Rico, the Department of Public Health of the Virgin Islands, the Department of Public Health and Social Services of the Government of Guam, and in selected *Vital Statistics of the United States* annual reports.

U.S. natality data are limited to births occurring within the United States, including those occurring to U.S. residents and nonresidents. Births to nonresidents of the United States have been excluded from all tabulations by place of residence beginning in 1970 (for further discussion see "Classification by occurrence and residence"). Births occurring to U.S. citizens outside the United States are not included in any tabulations in this report. Similarly the data for Puerto Rico, the Virgin Islands, Guam, and American Samoa are limited to births registered in these areas.

Standard Certificate of Live Birth

The U.S. Standard Certificate of Live Birth, issued by the Public Health Service, has served for many years as the principal means of attaining uniformity in the content of the documents used to collect information on births in the United States. It has been modified in each State to the extent required by the particular State's needs or by special provisions of the State's vital statistics law. However, most State certificates conform closely in content to the standard certificate.

The first standard certificate of birth was developed in 1900. Since then, it has been revised periodically by the national vital statistics agency through consultation with State health officers and registrars; Federal agencies concerned with vital statistics; national, State, and county medical societies; and others working in public health, social welfare, demography, and insurance. This procedure has assured careful evaluation of each item for its current and future usefulness for legal, medical, demographic, and research purposes. New items have been added when necessary, and old

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items have been modified to ensure better reporting or, in some cases, dropped when their usefulness appeared to be limited.

1989 revision--Effective January 1, 1989, a revised U.S. Standard Certificate of Live Birth (figure 4-A) replaced the 1978 revision. This revision provided a wide variety of new information on maternal and infant health characteristics, representing a significant departure from previous versions in both content and format. The most significant format change was the use of check boxes to obtain detailed medical and health information about the mother and child. It has been demonstrated that this format produces higher quality and more complete information than do open-ended items.

The reformatted items included "Medical Risk Factors for This Pregnancy," which combines the former items "Complications of Pregnancy" and "Concurrent Illnesses or Conditions Affecting the Pregnancy." "Complications of Labor and/or Delivery" and "Congenital Anomalies of Child" also have been revised from the open-ended format. For each of these items at least 15 specific conditions have been identified.

Several new items were added to the revised certificate. Included are items to obtain information on tobacco and alcohol use during pregnancy, weight gain during pregnancy, obstetric procedures, method of delivery, and abnormal conditions of the newborn. These items can be used to monitor the health practices of the mother that can affect pregnancy and the use of technology in childbirth, and to identify babies with specific abnormal conditions. When combined with other socioeconomic and health data, these items provide a wealth of information relevant to the etiology of low birth weight and other adverse pregnancy outcomes.

Another modification was the addition of a Hispanic identifier for the mother and father. Although NCHS had recommended that States add items to identify the Hispanic or ethnic origin of the newborn's parents, concurrent with the 1978 revision of the U.S. Standard Certificate of Live Birth and reported data from the cooperating States since that year, the item was new to the U.S. Standard Certificate for 1989.

The 1989 revised certificate also provided more detail than previously requested on the birth attendant and place of birth. This permits a more in-depth analysis of the number and characteristics of births by attendant and type of facility and a comparison of differences in outcome. For further discussion see individual sections for each item.

Classification of data

One of the principal values of vital statistics data is realized through the presentation of rates that are computed by relating the vital events of a class to the population of a similarly defined class. Vital statistics and population statistics, therefore, must be classified according to similarly defined systems and tabulated in comparable groups. Even when the variables common to both, such as geographic area, age, race, and sex, have been similarly classified and tabulated, differences between the enumeration method of obtaining population data and the registration method of obtaining vital statistics data may result in significant discrepancies.

The general rules used to classify geographic and personal items for live births are set forth in "Vital Statistics Classification and Coding Instructions for Live Birth Records, 1998," *NCHS Instruction Manual*, Part 3a. The classification of certain important items is discussed in the following pages. See table A for a listing of items and the percent of records that were not stated for each State, Puerto Rico, Virgin Islands, Guam, American Samoa, and the Northern Marianas.

Classification by occurrence and residence

Births to U.S. residents occurring outside this country are not reallocated to the United States. In tabulations by place of residence, births occurring within the United States to U.S. citizens and to resident aliens are allocated to the usual place of residence of the mother in the United States, as reported on the birth certificate. Beginning in 1970 births to nonresidents of the United States occurring in the United States are excluded from these tabulations. From 1966 to 1969 births occurring in the United States to mothers who were nonresidents of the United States were considered as births to residents of the exact place of occurrence; in 1964 and 1965 all such births were allocated to "balance of county" of

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occurrence even if the birth occurred in a city. The change in coding beginning in 1970 to exclude births to nonresidents of the United States from residence data significantly affects the comparability of data with years before 1970 only for Texas.

For the total United States the tabulations by place of residence and by place of occurrence are not identical. Births to nonresidents of the United States are included in data by place of occurrence but excluded from data by place of residence, as previously indicated. See table B for the number of births by residence and occurrence for the 50 States and the District of Columbia for 1998.

Residence error--A nationwide test of birth-registration completeness in 1950 provided measures of residence error for natality statistics. According to this test, errors in residence reporting for the country as a whole tend to overstate the number of births to residents of urban areas and to understate the number of births to residents of other areas. This tendency has assumed special importance because of a concomitant development--the increased utilization of hospitals in cities by residents of nearby places--with the result that a number of births are erroneously reported as having occurred to residents of urban areas. Another factor that contributes to this overstatement of urban births is the customary procedure of using "city" addresses for persons living outside the city limits.

Incomplete residence--Beginning in 1973 where only the State of residence is reported with no city or county specified and the State named is different from the State of occurrence, the birth is allocated to the largest city of the State of residence. Before 1973 such births were allocated to the exact place of occurrence.

Geographic classification

The rules followed in the classification of geographic areas for live births are contained in the instruction manual mentioned previously. The geographic code structure for 1998 is given in another manual, "Vital Records Geographic Classification, 1994," *NCHS Instruction Manual*, Part 8.

United States--In the statistical tabulations, "United States" refers only to the aggregate of the 50 States and the District of Columbia. Alaska has been included in the U.S. tabulations since 1959 and Hawaii since 1960.

Metropolitan statistical areas--The metropolitan statistical areas and primary metropolitan statistical areas (MSA's and PMSA's) used in this report are those established by the U.S. Office of Management and Budget as of April 1, 1990, and used by the U.S. Bureau of the Census (5) except in the New England States.

Except in the New England States, an MSA has either a city with a population of at least 50,000, or a Bureau of the Census urbanized area of at least 50,000 and a total MSA population of at least 100,000. A PMSA consists of a large urbanized county, or cluster of counties, that demonstrates very strong internal economic and social links and has a population over 1 million. When PMSA's are defined, the large area of which they are component parts is designated a Consolidated Metropolitan Statistical Area (CMSA) (6).

In the New England States the U.S. Office of Management and Budget uses towns and cities rather than counties as geographic components of MSA's and PMSA's. NCHS cannot, however, use this classification for these States because its data are not coded to identify all towns. Instead, the New England County Metropolitan Areas (NECMA's) are used. These areas are established by the U.S. Office of Management and Budget (7) and are made up of county units.

Metropolitan and nonmetropolitan counties--Independent cities and counties included in MSA's and PMSA's or NECMA's are included in data for metropolitan counties; all other counties are classified as nonmetropolitan.

Population-size groups--Beginning in 1994 vital statistics data for cities and certain other urban places have been classified according to the population enumerated in the 1990 Census of Population. Data are available for individual cities and other urban places of 100,000 or more population. Data for the remaining areas not separately identified are shown in the tables under the heading "Balance of area" or "Balance of county." Classification of areas for 1982-93 was determined by the population enumerated in the 1980 Census of Population. As a result of changes in the enumerated population between 1980 and 1990, some urban places identified in previous reports are no longer included, and a number of other urban places have been added.

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Urban places other than incorporated cities for which vital statistics data are shown in this report include the following:

- C Each town in New England, New York, and Wisconsin and each township in Michigan, New Jersey, and Pennsylvania that had no incorporated municipality as a subdivision and had either 25,000 inhabitants or more, or a population of 10,000 to 25,000 and a density of 1,000 persons or more per square mile.
- C Each county in States other than those indicated above that had no incorporated municipality within its boundary and had a density of 1,000 persons or more per square mile. (Arlington County, Virginia, is the only county classified as urban under this rule.)
- C Each place in Hawaii with 10,000 or more population. (There are no incorporated cities in Hawaii.)

Race or national origin

Beginning with the 1989 data year birth data are tabulated primarily by race of mother. In 1988 and prior years the race or national origin shown in tabulations was that of the newborn child. However, beginning with the 1992 issue of *Vital Statistics of the United States, Volume I, Natality*, trend data for years beginning with 1980 have been retabulated by race of mother. The race of the child was determined for statistical purposes by an algorithm based on the race of the mother and father as reported on the birth certificate. When the parents were of the same race, the race of the child was the same as the race of the parents. When the parents were of different races and one parent was white, the child was assigned to the race of the other parent. When the parents were of different races and neither parent was white, the child was assigned to the race of the father, with one exception--if either parent was Hawaiian, the child was assigned to Hawaiian. If race was missing for one parent, the child was assigned the race of the parent for whom it was reported. When information on race was missing for both parents, the race of the child was considered not stated and the birth was allocated according to rules discussed on page 4 of the Technical Appendix, volume I, *Vital Statistics of the United States*, 1988. In 1989 the criteria for reporting the race of the parents did not change and continues to reflect the response of the informant (usually the mother).

The most important factor influencing the decision to tabulate births by race of the mother was the decennial revision of the U.S. Standard Certificate of Live Birth in 1989. This revision included many more health questions that are directly associated with the mother, including alcohol and tobacco use, weight gain during pregnancy, medical risk factors, obstetric procedures, complications of labor and/or delivery, and method of delivery. Additionally, many of the other items that have been on the birth certificate for more than two decades also relate directly to the mother, for example, marital status, education level, and receipt of prenatal care. It is more appropriate to use the race of the mother than the race of the child in tabulating these items.

A second factor has been the increasing incidence of interracial parentage. In 1998, 5.3 percent of births were to parents of different races, more than double the percent in 1977 (2.0 percent). More than half of these births were to white mothers and fathers of another race (55 percent in 1998). There have been two major consequences of the increasing interracial parentage. One is the effect on birth rates by race. The number of white births under the former procedures has been arbitrarily limited to infants whose parents were both white (or one parent if the race of only one parent was reported). At the same time, the number of births of other races has been arbitrarily increased to include all births to white mothers and fathers of other races. Thus, prior to 1989, if race of mother had been used, birth rates per 1,000 white women in a given age group would have been higher, while comparable rates for black women and women of other races would have been lower. The other consequence of increasing interracial parentage is the impact on the racial differential in various characteristics of births, particularly in cases where there is generally a large racial disparity, such as the incidence of low birthweight. In this instance, the racial differential is larger when the data are tabulated by race of mother rather than by race of child. The same effect has been noted for characteristics such as nonmarital childbearing, preterm births, late or no prenatal care, and low educational attainment of mother.

The third factor influencing the change is the growing proportion of births with race of father not stated, 14 percent in 1998. Although this proportion has stabilized and declined slightly in the 1990's, it is still higher than in 1978, 11

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percent. The high proportion of records with the father's race not reported reflects the increase in the proportion of births to unmarried women; in many cases no information is reported on the father. These births were already assigned the race of the mother because there is no alternative. Tabulating births by race of mother provides a more uniform approach, rather than a necessarily arbitrary combination of parental races.

The change in the tabulation of births by race presents some problems when analyzing birth data by race, particularly trend data. The problem is likely to be acute for races other than white and black.

The categories for race or national origin are "White," "Black," "American Indian" (including Aleuts and Eskimos), "Chinese," "Japanese," "Hawaiian," "Filipino," and "Other Asian or Pacific Islander" (including Asian Indian). Before 1992 there was also an "other" category, which is now combined with the "Not stated" category. Before 1978 the category "Other Asian or Pacific Islander" was not identified separately but included with "Other" races. The separation of this category from "other" allows identification of the category "Asian or Pacific Islander" by combining the new category "Other Asian or Pacific Islander" with Chinese, Japanese, Hawaiian, and Filipino.

Beginning in 1992, NCHS contracted with seven States with the highest API populations to code births to additional API subgroups. The API subgroups include births to Vietnamese, Asian Indian, Korean, Samoan, Guamanian, and other API women. The seven States included in this reporting area are: California, Hawaii, Illinois, New Jersey, New York, Texas, and Washington. At least two-thirds of the U.S. population of each of these additional API groups lived in the seven-State reporting area(8). The data are available on the detailed natality tapes and CD-ROMs beginning with the 1992 data year. An analytic report based on the 1992 data year is also available upon request(9). In 1996, Minnesota became the eighth State to provide this information and in 1998, Virginia became the ninth State.

The category "White" comprises births reported as white and births where race is reported as Hispanic. Before 1964 all births for which race or national origin was not stated were classified as white. Beginning in 1964 changes in the procedures for allocating race when race or national origin is not stated have changed the composition of this category. (See discussion on "Race or national origin not stated.")

If the race or national origin of an Asian parent is ill-defined or not clearly identifiable with one of the categories used in the classification (for example, if "Oriental" is entered), an attempt is made to determine the specific race or national origin from the entry for place of birth. If the birthplace is China, Japan, or the Philippines, the race of the parent is assigned to that category. When race cannot be determined from birthplace, it is assigned to the category "Other Asian or Pacific Islander."

Race or national origin not stated--If the race of the mother is not defined or not identifiable with one of the categories used in the classification (0.8 percent of births in 1998) and the race of the father is known, the race of the father is assigned to the mother. Where information for both parents is missing, the race of the mother is allocated electronically according to the specific race of the mother on the preceding record with a known race of mother. Data for both parents were missing for only 0.4 percent of birth certificates for 1998. Nearly all statistics by race or national origin for the United States as a whole in 1962 and 1963 are affected by a lack of information for New Jersey, which did not report the race of the parents in those years. Birth rates by race for those years are computed on a population base that excluded New Jersey. For the method of estimating the U.S. population by age, sex, and race excluding New Jersey in 1962 and 1963, see page 4-8 in the Technical Appendix of volume I, *Vital Statistics of the United States*, 1963.

Age of mother

Beginning in 1989 an item on the birth certificate asks for "Date of Birth." In previous years, "Age (at time of this birth)" was requested. Not all States have revised this item for 1989, and therefore the age of mother either is derived from the reported month and year of birth or coded as stated on the certificate. In 1998 the mother's age was reported directly by five States (Kentucky, Nevada, North Dakota, Virginia, and Wyoming) and American Samoa. From 1964 to 1996, the age of mother was edited for 10-49 years. When the age of mother was computed to be under 10 years or 50 years or over, it was considered not stated and was assigned as described below. Beginning in 1997, age of mother is edited for ages 10-54 years. When the age of mother is computed to be under 10 years or 55 years or over, it is considered not stated and was assigned as described below. A review and verification of unedited birth data for 1996 showed that the vast majority

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of births reported as occurring to women aged 50 years and older were to women aged 50-54 years. The numbers of births to women 50-54 years are too small for computing age-specific birth rates. These births have been included with births to women 45-49 for computing birth rates.

Age-specific birth rates are based on populations of women by age, prepared by the U.S. Bureau of the Census. In census years the decennial census counts are used. In intercensal years, estimates of the population of women by age are published by the U.S. Bureau of the Census in *Current Population Reports*.

The 1990 Census of Population derived age in completed years as of April 1, 1990, from the responses to questions on age at last birthday and month and year of birth, with the latter given preference. In the 1960, 1970, and the 1980 Census of Population, age was also derived from month and year of birth. "Age in completed years" was asked in censuses before 1960. This was nearly the equivalent of the former birth certificate question, which the 1950 test of matched birth and census records confirms by showing a high degree of consistency in reporting age in these two sources (10).

Median age of mother--Median age is the value that divides an age distribution into two equal parts, one-half of the values being less and one-half being greater. Median ages of mothers for 1960 to the present have been computed from birth rates for 5-year age groups rather than from birth frequencies. This method eliminates the effects of changes in the age composition of the childbearing population over time. Changes in the median ages from year to year can thus be attributed solely to changes in the age-specific birth rates.

Not stated date of birth of mother-- In 1998 age of mother was not reported on 0.02 percent of the records. Beginning in 1964 birth records with date of birth of mother and/or age of mother not stated have had age imputed according to the age of mother from the previous birth record of the same race and total-birth order (total of fetal deaths and live births). (See "Computer Edits for Natality Data, Effective 1993" NCHS Instruction Manual, Part 12, page 9.) In 1963 birth records with age not stated were allocated according to the age appearing on the record previously processed for a mother of identical race and parity (number of live births). For 1960-62 not stated ages were distributed in proportion to the known ages for each racial group. Before 1960 this was done for age-specific birth rates but not for the birth frequency tables, which showed a separate category for age not stated.

Age of father

Age of father is derived from the reported date of birth or coded as stated on the birth certificate. If the age is under 10 years, it is considered not stated and grouped with those cases for which age is not stated on the certificate. Information on age of father is often missing on birth certificates of children born to unmarried mothers, greatly inflating the number of "not stated" in all tabulations by age of father. In computing birth rates by age of father, births tabulated as age of father not stated are distributed in the same proportions as births with known age within each 5-year-age classification of the mother. This procedure is followed because, while father's age is missing in 15 percent of the birth certificates in 1998, one third of these were on records where the mother is a teenager. This distribution procedure is done separately by race. The resulting distributions are summed to form a composite frequency distribution that is the basis for computing birth rates by age of father. This procedure avoids the distortion in rates that would result if the relationship between age of mother and age of father were disregarded.

Live-birth order and parity

Live-birth order and parity classifications refer to the total number of live births the mother has had including the 1998 birth. Fetal deaths are excluded.

Live-birth order indicates what number the present birth represents; for example, a baby born to a mother who has had two previous live births (even if one or both are not now living) has a live-birth order of three. Parity indicates how many live births a mother has had. Before delivery a mother having her first baby has a parity of zero and a mother having her third baby has a parity of two. After delivery the mother of a baby who is a first live birth has a parity of one and the mother of a baby who is a third live birth has a parity of three.

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Live-birth order and parity are determined from two items on the birth certificate, "Live births now living" and "Live births now dead."

Not stated birth order--Before 1969 if both of these items were blank, the birth was considered a first birth. Beginning in 1969, births for which the pregnancy history items were not completed have been tabulated as live-birth order not stated. As a result of this revised procedure, 22,686 births in 1969 that would have been assigned to the "First birth order" category under the old rules were assigned to the "Not stated" category.

All births tabulated in the "Not stated birth order" category are excluded from the computation of percents. In computing birth rates by live-birth order, births tabulated as birth order not stated are distributed in the same proportion as births of known live-birth order.

Date of last live birth

The date of last live birth was added to the U.S. Standard Certificate of Live Birth in 1968 for the purpose of providing information on child spacing. The interval since the last live birth is the difference between the date of last live birth and the date of present birth. For an interval to be computed, both the month and year of the last live birth must be valid. This interval is computed only for events to mothers who have had at least one previous live birth. Births for which the interval since last live birth is not stated are excluded from the computation of percents and means.

Zero interval--An interval of zero months since the last live birth indicates the second born of a set of twins, the second or third born of a set of triplets, and so forth. Births with an interval of zero months are excluded from the computation of mean intervals.

Beginning in 1995, NCHS ceased to collect information on the date of last live birth and thus the information on interval is only available from birth certificate data from 1968-94.

Educational attainment

Data on the educational attainment of both parents were collected beginning in 1968 and tabulated for publication in 1969 for the first time.

The educational attainment of either parent is defined as "the number of years of school completed." Only those years completed in "regular" schools are counted, that is, a formal educational system of public schools or the equivalent in accredited private or parochial schools. Business or trade schools, such as beauty and barber schools, are not considered "regular" schools for the purposes of this item. No attempt has been made to convert years of school completed in foreign school systems, ungraded school systems, and so forth, to equivalent grades in the American school system. Such entries are included in the category "not stated."

Persons who have completed only a partial year in high school or college are tabulated as having completed the highest preceding grade. For those certificates on which a specific degree is stated, years of school completed is coded to the level at which the degree is most commonly attained; for example, persons reporting B.A., A.B., or B.S. degrees are considered to have completed 16 years of school.

Education not stated--The category "Not stated" includes all records in reporting areas for which there is no information on years of school completed as well as all records for which the information provided is not compatible with coding specifications.

Births tabulated as education not stated are excluded from the computations of percents.

Beginning in 1995, NCHS ceased to collect information on the educational attainment of the father and thus the information is available from birth certificate data only for 1969-94.

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Marital status

National estimates of births to unmarried women are based on two methods of determining marital status. For 1994 through 1996, birth certificates in 45 states and the District of Columbia included a question about the mother's marital status. Beginning in 1997, California added a direct question to their birth certificate; thus **by** 1997, all but four States (Connecticut, Michigan, Nevada, and New York) included a direct question on their birth certificates. Nevada asks for the mother's marital status through the electronic birth registration process but this item is not included on certified or paper copies of the birth certificate. Beginning June 15, 1998, Connecticut discontinued inferring the mother's marital status and added a direct question on mother's marital status to the State's birth certificate.

In the two States (Michigan and New York) which used inferential procedures to compile birth statistics by marital status in 1998, a birth is inferred as nonmarital if either of these factors is present: a paternity acknowledgment was received or the father's name is missing. In recent years, a number of States have extended their efforts to identify the fathers when the parents are not married in order to enforce child support obligations. The presence of a paternity acknowledgment therefore is the most reliable indicator that the birth is nonmarital in the States not reporting this information directly; this is now the key indicator in the nonreporting States. The inferential procedures in effect since 1980 represent a substantial departure from the method used before 1980 to prepare national estimates of births to unmarried women, which assumed that the incidence of births to unmarried women in States with no direct question on marital status was the same as the incidence in reporting States in the same geographic division (12). Inferential procedures in current use, however, are quite different from those in use during the 1980's, when there was heavy reliance on a comparison of the surnames of the parents and the child to infer the mother's marital status. The procedures now in use depend, as noted above, on very reliable indicators, namely a paternity affidavit or missing information on the father.

A review of Connecticut's birth data for 1998 indicates that during the first 6 months of 1998, when the inferential procedures were still in use, the proportion of births to unmarried women was somewhat higher (33 percent) than in the last 6 months when marital status was based on a direct question (29 percent). The inferential procedures in effect in Connecticut relied principally on a comparison of the surnames of the parents and child. It appears that the inferential procedures resulted in some overestimation of the number of births to unmarried women. It is estimated that if the Connecticut reporting procedures had not changed, the number of nonmarital births would have been about 1,000 higher. Because Connecticut accounts for about 1 percent of U.S. births, the reporting changes had no impact on data for the Nation.

The procedures for reporting marital status in California, Nevada, New York City changed beginning January 1, 1997. The methods used to determine marital status and the impact of the procedures on the data were discussed in detail in a previous report (13).

The use of inferential marital status data together with information from a direct question represents an attempt to use related information on the birth certificate to improve the quality of national data as well as to provide data for the individual nonreporting States. An evaluation of this method and its validity for California (the largest nonreporting State until 1997) has been published (14). Because of the continued substantial increases in nonmarital childbearing throughout the 1980's, the data have been intensively evaluated by the Division of Vital Statistics, NCHS. The results of this evaluation show that trends in birth rates for unmarried women for rates computed on the basis of estimated data and on the basis of inferred data are essentially the same.

The mother's marital status was not reported in 1998 on 0.04 percent of the birth records. Marital status was imputed as "married" for these records.

When births to unmarried women are reported as second or higher order births, it is not known whether the mother was married or unmarried when the previous deliveries occurred, because her marital status at the time of these earlier births is not available from the birth record.

Rates for 1940 and 1950 are based on decennial census counts. Rates for 1955-97 are based on a smoothed series of population estimates (12). Because of sampling error, the original U.S. Bureau of the Census population estimates by marital status fluctuate erratically from year to year; therefore, they have been smoothed so that the rates do not show

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similar variations. These rates differ from those published in volumes of *Vital Statistics of the United States* before 1969, which were based on the original estimates provided annually by the U.S. Bureau of the Census. Birth rates by marital status for 1971-79 have been revised and differ from rates published before 1980 in volumes of *Vital Statistics of the United States* (see "Computation of rates and other measures").

Place of delivery and attendant at birth

The 1989 revision of the U.S. Standard Certificate of Live Birth included separate categories for freestanding birthing centers, the mother's residence, and clinic or doctor's office as the place of birth. Prior to 1989, place of birth was classified simply as either "In hospital" or "Not in hospital." Births occurring in hospitals, institutions, clinics, centers, or homes were included in the category "In hospital." In this context the word "homes" does not refer to the mother's residence but to an institution, such as a home for unmarried women. Birthing centers were included in either category, depending on each State's assessment of the facility. Beginning in 1989 births occurring in clinics and in birthing centers not attached to a hospital are classified as "Not in hospital." This change in classification may account in part for the lower proportion of "In hospital" births compared with previous years. (The change in classification of clinics should have minor impact because comparatively few births occur in these facilities, but the effect of any change in classification of freestanding birthing centers is unknown.)

Beginning in 1975 the attendant at birth and place of delivery items were coded independently, primarily to permit the identification of the person in attendance at hospital deliveries. The 1989 certificate includes separate classifications for doctor of medicine (MD), doctor of osteopathy (DO), certified nurse midwife (CNM), other midwife, and other attendants. In earlier certificates births attended by certified nurse midwives were grouped with those attended by lay midwives. The new certificate also facilitates the identification of home births, births in freestanding birthing centers, and births in clinics or physician offices.

Data for the "In hospital" category for 1975-88 include all births in clinics or maternity centers, regardless of the attendant. Data for 1975-77 published before 1980 included clinic and center births in the category "In hospital" only when the attendant was a physician. Data shown for 1975-77 published after 1980 will, therefore, differ from data published before 1980. As a result of this change, for 1975 an additional 12,352 births are now classified as occurring in hospitals, raising the percent of births occurring in hospitals from 98.7 to 99.1. Similarly, for 1976 the number of births occurring in hospitals increased by 14,133 and the percent in hospitals raised from 98.6 to 99.1; for 1977 the increase is 15,937 and the percent in hospitals raised from 98.5 to 99.0. For 1974 and earlier the "In hospital" category includes all births in hospitals or institutions and births in clinics, centers, or maternity homes only when attended by physicians.

The "Not in hospital" category includes births for which no information is reported on place of birth. Before 1975 births for which the stated place of birth was a "doctor's office" and delivery was by a physician were included in the category "In hospital." Beginning in 1975 these births were tabulated as "Not in hospital" and included with births delivered by physicians in this category. Although the actual number of such births is unknown, the effect of the change is minimal. In 1974, 0.3 percent of all births were delivered by physicians outside of hospitals; in 1975 this proportion was 0.4 percent.

Babies born on the way to or on arrival at the hospital are classified as having been born in the hospital. This may account for some of the hospital births not delivered by physicians or midwives.

Beginning in 1993, all in-hospital births occurring in Illinois where the attendant was classified as an "other" midwife were changed to certified nurse-midwife. This was necessary because almost all of these births were delivered by midwives certified by the American College of Nurse Midwives but because Illinois does not certify midwives, many of these births were classified as "other" midwives.

Birthweight

Birthweight is reported in some areas in pounds and ounces rather than in grams. However, the metric system has been used in tabulating and presenting the statistics to facilitate comparison with data published by other groups. The

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categories for birthweight were changed in 1979 to be consistent with the recommendations in the *Ninth Revision of the International Classification of Diseases (ICD-9)*. The categories in gram intervals and their equivalents in pounds and ounces are as follows:

Less than 500 grams = 1 lb 1 oz or less
500-999 grams = 1 lb 2 oz-2 lb 3 oz
1,000-1,499 grams = 2 lb 4 oz-3 lb 4 oz
1,500-1,999 grams = 3 lb 5 oz-4 lb 6 oz
2,000-2,499 grams = 4 lb 7 oz-5 lb 8 oz
2,500-2,999 grams = 5 lb 9 oz-6 lb 9 oz
3,000-3,499 grams = 6 lb 10 oz-7 lb 11 oz
3,500-3,999 grams = 7 lb 12 oz-8 lb 13 oz
4,000-4,499 grams = 8 lb 14 oz-9 lb 14 oz
4,500-4,999 grams = 9 lb 15 oz-11 lb 0 oz
5,000 grams or more = 11 lb 1 oz or more

The ICD-9 defines low birthweight as less than 2,500 grams. This is a shift of 1 gram from the previous criterion of 2,500 grams or less, which was recommended by the American Academy of Pediatrics in 1935 and adopted in 1948 by the World Health Organization in the *Sixth Revision of the International Lists of Diseases and Causes of Death*.

After data classified by pounds and ounces are converted to grams, median weights are computed and rounded before publication. To establish the continuity of class intervals needed to convert pounds and ounces to grams, the end points of these intervals are assumed to be half an ounce less at the lower end and half an ounce more at the upper end. For example, 2 lb 4 oz-3 lb 4 oz is interpreted as 2 lb 3 ½ oz-3 lb 4 ½ oz.

Births for which birthweight is not reported are excluded from the computation of percents and medians.

Period of gestation

The period of gestation is defined as beginning with the first day of the last normal menstrual period (LMP) and ending with the day of the birth. The LMP is used as the initial date because it can be more accurately determined than the date of conception, which usually occurs 2 weeks after the LMP.

Births occurring before 37 completed weeks of gestation are considered to be “preterm” or “premature” for purposes of classification. At 37-41 weeks gestation, births are considered to be “term,” and at 42 completed weeks and over, “postterm.” These distinctions are according to the ICD-9 definitions.

The 1989 revision of the U.S. Standard Certificate of Live Birth included a new item, “clinical estimate of gestation,” that is being compared with length of gestation computed from the LMP date when the latter appears to be inconsistent with birthweight. This is done for normal weight births of apparently short gestations and very low birthweight births reported to be full term. The clinical estimate also was used if the date of the LMP was not reported. The period of gestation for 5.1 percent of the births in 1998 was based on the clinical estimate of gestation. For 97 percent of these records the clinical estimate was used because the LMP date was not reported. For the remaining 3 percent the clinical estimate was used because it was compatible with the reported birth weight, whereas the LMP-computed gestation was not. In cases where the reported birthweight was inconsistent with both the LMP-computed gestation and the clinical estimate of gestation, the LMP-computed gestation was used if it was within 5 weeks of the clinical estimate and birth weight was reclassified as “not stated.” This was necessary for about 350 births, less than 0.01 percent of all birth records in 1998. If the reported birthweight was inconsistent with both the LMP-computed gestation and the clinical estimate of gestation, gestation and birthweight were classified as “not stated” if the LMP-computed gestation was not within 5 weeks of the clinical estimate. These changes result in only a very small discontinuity in the data. For further information on the use of the clinical estimate of gestation see “Computer Edits for Natality Data, Effective 1993,” *NCHS Instruction Manual*, Part 12, pages 34-36.

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Before 1981 the period of gestation was computed only when there was a valid month, day, and year of LMP. However, length of gestation could not be determined from a substantial number of live-birth certificates each year because the day of LMP was missing. Beginning in 1981 weeks of gestation have been imputed for records with missing day of LMP when there is a valid month and year. Each such record is assigned the gestational period in weeks of the preceding record that has a complete LMP date with the same computed months of gestation and the same 500-gram birthweight interval. The effect of the imputation procedure is to increase slightly the proportion of preterm births and to lower the proportion of births at 39, 40, 41, and 42 weeks of gestation. A more complete discussion of this procedure and its implications is presented in a previous report (15).

Because of postconception bleeding or menstrual irregularities, the presumed date of LMP may be in error. In these instances the computed gestational period may be longer or shorter than the true gestational period, but the extent of such errors is unknown.

Month of pregnancy prenatal care began

For those records in which the name of the month is entered for this item, instead of first, second, third, and so forth, the month of pregnancy in which prenatal care began is determined from the month named and the month last normal menses began. For these births, if the item "Date last normal menses began" is not stated, the month of pregnancy in which prenatal care began is tabulated as not stated.

Number of prenatal visits

Tabulations of the number of prenatal visits were presented for the first time in 1972. Beginning in 1989 these data were collected from the birth certificates of all States. Percent distributions and the median number of prenatal visits exclude births to mothers who had no prenatal care.

Apgar score

The 1- and 5-minute Apgar scores were added to the U.S. Standard Certificate of Live Birth in 1978 to evaluate the condition of the newborn infant at 1 and 5 minutes after birth. The Apgar score is a useful measure of the need for resuscitation and a predictor of the infant's chances of surviving the first year of life. It is a summary measure of the infant's condition based on heart rate, respiratory effort, muscle tone, reflex irritability, and color. Each of these factors is given a score of 0, 1, or 2; the sum of these 5 values is the Apgar score, which ranges from 0 to 10. A score of 10 is optimum, and a low score raises some doubts about the survival and subsequent health of the infant. Beginning in 1995, NCHS only collected information on the 5-minute Apgar score. In 1998 the reporting area for the 5-minute Apgar score was comprised of 48 States and the District of Columbia, accounting for 78 percent of all births in the United States. California and Texas did not have information on Apgar scores on their birth certificate.

Tobacco and alcohol use during pregnancy

The checkbox format allows for classification of a mother as a smoker or drinker during pregnancy and for reporting the average number of cigarettes smoked per day or drinks consumed per week. When smoking and/or drinking status is not reported or is inconsistent with the quantity of cigarettes or drinks reported, the status is changed to be consistent with the amount reported. For example, if the drinking status is reported as "no" but one or more average drinks a week are reported, the mother is classified as a drinker. If the number of cigarettes smoked per day is reported as one or more, the mother is considered a smoker. When one (or a fraction of one) drink a week is recorded, the mother is classified as a drinker. For records on which the number of drinks or number of cigarettes is reported as a span, for example, 10-15, the

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lower number is used. The number of drinkers and number of drinks reported on birth certificates are believed to underestimate actual alcohol use.

Data on tobacco use were collected by 46 States, the District of Columbia, and New York City in 1998. This reporting area accounted for 81 percent of all births in the U.S. in 1998. Information was not available for California, Indiana, South Dakota, and the remainder of New York State. Information on alcohol use was included on the certificates of 48 States and the District of Columbia, accounting for 87 percent of all U.S. births in 1998. California and South Dakota did not include items on alcohol use on their birth certificates.

Weight gained during pregnancy

Weight gain is reported in pounds. A loss of weight is reported as zero gain. Computations of median weight gain were based on ungrouped data. This item was included on the certificates of 49 States and the District of Columbia; California did not report this information. This reporting area excluding California accounted for 87 percent of all births in the United States in 1998.

Medical risk factors for this pregnancy

In 1998 an item on medical risk factors was included on the birth certificates of all States and the District of Columbia, but 2 States did not report all of the 16 risk factors. Texas did not report genital herpes or uterine bleeding, and Kansas did not report Rh sensitization.

The format allows for the designation of more than one risk factor and includes a choice of "None." Accordingly, if the item is not completed, it is classified as "Not stated."

The following definitions are adapted and abbreviated from a set of definitions compiled by a committee of Federal and State health statistics officials for the Association for Vital Records and Health Statistics (16).

Definitions of medical terms

Anemia--Hemoglobin level of less than 10.0 g/dL during pregnancy or a hematocrit of less than 30 percent during pregnancy.

Cardiac disease--Disease of the heart.

Acute or chronic lung disease--Disease of the lungs during pregnancy.

Diabetes--Metabolic disorder characterized by excessive discharge of urine and persistent thirst; includes juvenile onset, adult onset, and gestational diabetes during pregnancy.

Genital herpes--Infection of the skin of the genital area by herpes simplex virus.

Hydramnios/oligohydramnios--Any noticeable excess (hydramnios) or lack (oligohydramnios) of amniotic fluid.

Hemoglobinopathy--A blood disorder caused by alteration in the genetically determined molecular structure of hemoglobin (for example, sickle cell anemia).

Hypertension, chronic--Blood pressure persistently greater than 140/90, diagnosed prior to onset of pregnancy or before the 20th week of gestation.

Hypertension, pregnancy-associated--An increase in blood pressure of at least 30 mm Hg systolic or 15 mm Hg diastolic on two measurements taken 6 hours apart after the 20th week of gestation.

Eclampsia--The occurrence of convulsions and/or coma unrelated to other cerebral conditions in women with signs and symptoms of pre-eclampsia.

Incompetent cervix--Characterized by painless dilation of the cervix in the second trimester or early in the third trimester of pregnancy, with prolapse of membranes through the cervix and ballooning of the membranes into the vagina, followed by rupture of membranes and subsequent expulsion of the fetus.

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Previous infant 4,000+ grams--The birthweight of a previous live-born child was over 4,000 grams (8 lbs 13 oz).
Previous preterm or small-for-gestational-age infant--Previous birth of an infant prior to term (before 37 completed weeks of gestation) or of an infant weighing less than the 10th percentile for gestational age using a standard weight-for-age chart.

Renal disease--Kidney disease.

Rh sensitization--The process or state of becoming sensitized to the Rh factor as when an Rh-negative woman is pregnant with an Rh-positive fetus.

Uterine bleeding--Any clinically significant bleeding during the pregnancy, taking into consideration the stage of pregnancy; any second or third trimester bleeding of the uterus prior to the onset of labor.

Obstetric procedures

This item includes six specific obstetric procedures. Birth records with "Obstetric procedures" left blank are considered "not stated." Data on obstetric procedures were reported by all States and the District of Columbia in 1998.

The following definitions are adapted and abbreviated from a set of definitions compiled by a committee of Federal and State health statistics officials for the National Association for Public Health Statistics and Information Systems (NAPHSIS), formerly the Association for Vital Records and Health Statistics (16).

Definitions of medical terms

Amniocentesis--Surgical transabdominal perforation of the uterus to obtain amniotic fluid to be used in the detection of genetic disorders, fetal abnormalities, and fetal lung maturity.

Electronic fetal monitoring--Monitoring with external devices applied to the maternal abdomen or with internal devices with an electrode attached to the fetal scalp and a catheter through the cervix into the uterus, to detect and record fetal heart tones and uterine contractions.

Induction of labor--The initiation of uterine contractions before the spontaneous onset of labor by medical and/or surgical means for the purpose of delivery.

Stimulation of labor--Augmentation of previously established labor by use of oxytocin.

Tocolysis--Use of medications to inhibit preterm uterine contractions to extend the length of pregnancy and therefore avoid a preterm birth.

Ultrasound--Visualization of the fetus and placenta by means of sound waves.

Complications of labor and/or delivery

The checkbox format allows for the selection of 15 specific complications and for the designation of more than 1 complication where appropriate. A choice of "None" is also included. Accordingly, if the item is not completed, it is classified as "not stated."

All States and the District of Columbia included this item on their birth certificates in 1998. However, Texas did not report all of the complications. Texas did not report anesthetic complications or fetal distress.

The following definitions are adapted and abbreviated from a set of definitions compiled by a committee of Federal and State health statistics officials (16).

Definitions of medical terms

Febrile--A fever greater than 100 degrees F. or 38 C. occurring during labor and/or delivery.

Meconium, moderate/heavy--Meconium consists of undigested debris from swallowed amniotic fluid, various

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products of secretion, excretion, and shedding by the gastrointestinal tract; moderate to heavy amounts of meconium in the amniotic fluid noted during labor and/or delivery.

Premature rupture of membranes (more than 12 hours)--Rupture of the membranes at any time during pregnancy and more than 12 hours before the onset of labor.

Abruptio placenta--Premature separation of a normally implanted placenta from the uterus.

Placenta previa--Implantation of the placenta over or near the internal opening of the cervix.

Other excessive bleeding--The loss of a significant amount of blood from conditions other than abruptio placenta or placenta previa.

Seizures during labor--Maternal seizures occurring during labor from any cause.

Precipitous labor (less than 3 hours)--Extremely rapid labor and delivery lasting less than 3 hours.

Prolonged labor (more than 20 hours)--Abnormally slow progress of labor lasting more than 20 hours.

Dysfunctional labor--Failure to progress in a normal pattern of labor.

Breech/malpresentation--At birth, the presentation of the fetal buttocks rather than the head, or other malpresentation.

Cephalopelvic disproportion--The relationship of the size, presentation, and position of the fetal head to the maternal pelvis prevents dilation of the cervix and/or descent of the fetal head.

Cord prolapse--Premature expulsion of the umbilical cord in labor before the fetus is delivered.

Anesthetic complications--Any complication during labor and/or delivery brought on by an anesthetic agent or agents.

Fetal distress--Signs indicating fetal hypoxia (deficiency in amount of oxygen reaching fetal tissues).

Abnormal conditions of the newborn

This item provides information on eight specific abnormal conditions. More than one abnormal condition may be reported for a given birth or "None" may be selected. If the item is not completed it is tabulated as "not stated." This item was included on the birth certificates of all States and the District of Columbia in 1998. However, four areas did not include all conditions. Nebraska and Texas did not report birth injury, New York City did not report assisted ventilation less than 30 minutes or assisted ventilation of 30 minutes or more, and Wisconsin did not report fetal alcohol syndrome.

The following definitions are adapted and abbreviated from a set of definitions compiled by a committee of Federal and State health statistics (16).

Definitions of medical terms

Anemia--Hemoglobin level of less than 13.0 g/dL or a hematocrit of less than 39 percent.

Birth injury--Impairment of the infant's body function or structure due to adverse influences that occurred at birth.

Fetal alcohol syndrome--A syndrome of altered prenatal growth and development occurring in infants born of women who consumed excessive amounts of alcohol during pregnancy.

Hyaline membrane disease/RDS--A disorder primarily of prematurity, manifested clinically by respiratory distress and pathologically by pulmonary hyaline membranes and incomplete expansion of the lungs at birth.

Meconium aspiration syndrome--Aspiration of meconium by the fetus or newborn, affecting the lower respiratory system.

Assisted ventilation (less than 30 minutes)--A mechanical method of assisting respiration for newborns with respiratory failure.

Assisted ventilation (30 minutes or more)--Newborn placed on assisted ventilation for 30 minutes or longer.

Seizures--A seizure of any etiology.

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Congenital anomalies of child

The data provided in this item relate to 21 specific anomalies or anomaly groups. It is well documented that congenital anomalies, except for the most visible and most severe, are incompletely reported on birth certificates. The completeness of reporting specific anomalies depends on how easily they are recognized in the short time between birth and birth-registration. Forty-nine States and the District of Columbia included this item on their birth certificates (New Mexico did not). This reporting area included 99 percent of all births in the United States in 1998. The format allows for the identification of more than one anomaly including a choice of "None" should no anomalies be evident. The category "not stated" includes birth records for which the item is not completed.

The following definitions are adapted and abbreviated from a set of definitions compiled by a committee of Federal and State health statistics officials (16).

Definitions of medical terms

Anencephalus--Absence of the cerebral hemispheres.

Spina bifida/meningocele--Developmental anomaly characterized by defective closure of the bony encasement of the spinal cord, through which the cord and meninges may or may not protrude.

Hydrocephalus--Excessive accumulation of cerebrospinal fluid within the ventricles of the brain with consequent enlargement of the cranium.

Microcephalus--A significantly small head.

Other central nervous system anomalies--Other specified anomalies of the brain, spinal cord, and nervous system.

Heart malformations--Congenital anomalies of the heart.

Other circulatory/respiratory anomalies--Other specified anomalies of the circulatory and respiratory systems.

Rectal atresia/stenosis--Congenital absence, closure, or narrowing of the rectum.

Tracheo-esophageal fistula/Esophageal atresia--An abnormal passage between the trachea and the esophagus; esophageal atresia is the congenital absence or closure of the esophagus.

Omphalocele/gastroschisis--An omphalocele is a protrusion of variable amounts of abdominal viscera from a midline defect at the base of the umbilicus. In gastroschisis, the abdominal viscera protrude through an abdominal wall defect, usually on the right side of the umbilical cord insertion.

Other gastrointestinal anomalies--Other specified congenital anomalies of the gastrointestinal system.

Malformed genitalia--Congenital anomalies of the reproductive organs.

Renal agenesis--One or both kidneys are completely absent.

Other urogenital anomalies--Other specified congenital anomalies of the organs concerned in the production and excretion of urine, together with organs of reproduction.

Cleft lip/palate--Cleft lip is a fissure of elongated opening of the lip; cleft palate is a fissure in the roof of the mouth. These are failures of embryonic development.

Polydactyly/syndactyly/adactyly--Polydactyly is the presence of more than five digits on either hands and/or feet; syndactyly is having fused or webbed fingers and/or toes; adactyly is the absence of fingers and/or toes.

Club foot--Deformities of the foot, which is twisted out of shape or position.

Diaphragmatic hernia--Herniation of the abdominal contents through the diaphragm into the thoracic cavity usually resulting in respiratory distress.

Other musculoskeletal/integumental anomalies--Other specified congenital anomalies of the muscles, skeleton, or skin.

Down's syndrome--The most common chromosomal defect with most cases resulting from an extra chromosome (trisomy 21).

Other chromosomal anomalies--All other chromosomal aberrations.

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Method of delivery

The birth certificate contains a checkbox item on method of delivery. The choices include vaginal delivery, with the additional options of forceps, vacuum, and vaginal birth after previous cesarean section (VBAC), as well as a choice of primary or repeat cesarean. When only forceps, vacuum, or VBAC is checked, a vaginal birth is assumed. In 1998 this information was collected from the birth certificates of all States and the District of Columbia.

Several rates are computed for method of delivery. The overall cesarean section rate or total cesarean rate is computed as the proportion of all births that were delivered by cesarean section. The primary cesarean rate is a measure that relates the number of women having a primary cesarean birth to all women giving birth who have never had a cesarean delivery. The denominator for this rate is the sum of women with a vaginal birth excluding VBACs and women with a primary cesarean birth. The rate for vaginal birth after previous cesarean (VBAC) delivery is computed by relating all VBAC deliveries to the sum of VBAC and repeat cesarean deliveries, that is, to women with a previous cesarean section. VBAC rates for first births exist because the rates are computed on the basis of previous pregnancies, not just live births.

Hispanic parentage

The 1989 revision of the U.S. Standard Certificate of Live Births includes items to identify the Hispanic origin of the parents. Concurrent with the 1978 revision of the U.S. Certificate of Live Birth, NCHS recommended that items to identify the Hispanic or ethnic origin of the newborn's parents be included on birth certificates and has tabulated and evaluated these data from the reporting States. All 50 States and the District of Columbia reported Hispanic origin of the parents for 1998. In 1989 Louisiana, New Hampshire, and Oklahoma did not report this information; in 1990 New Hampshire and Oklahoma did not report, and in 1991-92 New Hampshire did not report Hispanic origin.

In computing birth and fertility rates for the Hispanic population, births with origin of mother not stated are included with non-Hispanic births rather than being distributed. Thus, rates for the Hispanic population are underestimates of the true rates to the extent that the births with origin of mother not stated (1.2 percent in 1998) were actually to Hispanic mothers. The population with origin not stated was imputed. The effect on the rates is believed to be small.

Quality of data

Although vital statistics data are useful for a variety of administrative and scientific purposes, they cannot be correctly interpreted unless various qualifying factors and methods of classification are taken into account. The factors to be considered depend on the specific purposes for which the data are to be used. It is not feasible to discuss all the pertinent factors in the use of vital statistics tabulations, but some of the more important ones should be mentioned.

Most of the factors limiting the use of data arise from imperfections in the original records or from the impracticability of tabulating these data in very detailed categories. These limitations should not be ignored, but their existence does not lessen the value of the data for most general purposes.

Completeness of registration

An estimated 99 percent of all births occurring in the United States in 1998 were registered; for white births registration was 99.4 percent complete and for all other births, 98.6 percent complete. These estimates are based on the results of the 1964-68 test of birth-registration completeness according to place of delivery (in or out of hospital) and race and on the 1989 proportions of births in these categories. The primary purpose of the test was to obtain current measures of registration completeness for births in and out of hospital by race on a national basis. Data for States were not available

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as they had been from the previous birth-registration tests in 1940 and 1950. A detailed discussion of the method and results of the 1964-68 birth-registration test is available (17).

The 1964-68 test has provided an opportunity to revise the estimates of birth-registration completeness for the years since the previous test in 1950 to reflect the improvement in registration. This has been done using registration completeness figures from the two tests by place of delivery and race. Estimates of registration completeness for four groups (based on place of delivery and race) for 1951-65 were computed by interpolation between the test results. (It was assumed that the data from the more recent test are for 1966, the midpoint of the test period.) The results of the 1964-68 test are assumed to prevail for 1966 and later years. These estimates were used with the proportions of births registered in these categories to obtain revised numbers of births adjusted for underregistration for each year. The overall percent of birth-registration completeness by race was then computed. Data adjusted for underregistration for 1951-59 have been revised to be consistent with the 1964-68 test results and differ slightly from data shown in annual reports for years before 1969. For these years the published number of births and birth rates for both racial groups have been revised slightly downward because the 1964-68 test indicated that previous adjustments to registered births were slightly inflated. Because registration completeness figures by age of mother and by live-birth order are not available from the 1964-68 test, it must be assumed that the relationships among these variables have not changed since 1950.

*Discontinuation of adjustment for underregistration, 1960--*Adjustment for underregistration of births was discontinued in 1960 when birth registration for the United States was estimated to be 99.1 percent complete. This removed a bias introduced into age-specific rates when adjusted births classified by age were used. Age-specific rates are calculated by dividing the number of births to an age group of mothers by the population of women in that age group. Tests have shown that population figures are likely to be understated through census undercounts; these errors compensate for underregistration of births. Adjustment for underregistration of births, therefore, removes the compensating effect of under enumeration, biasing the age-specific rates more than when uncorrected birth and population data are used. (For further details see page 4-11 in the Technical Appendix of volume I, Vital Statistics of the United States, 1963.)

The age-specific rates used in the cohort fertility tables are an exception to the above statement. These rates are computed from births corrected for underregistration and population estimates adjusted for under enumeration and misstatement of age. Adjusted birth and population estimates are used for the cohort rates because they are an integral part of a series of rates, estimated with a consistent methodology. It was considered desirable to maintain consistency with respect to the cohort rates, even though it means that they will not be precisely comparable with other rates shown for 5-year age groups.

Completeness of reporting

Interpretation of these data must include evaluation of item completeness. The percent "not stated" is one measure of the quality of the data. Completeness of reporting varies among items and States. See table A for the percent of birth records on which specified items were not stated.

Quality control procedures

States in the Vital Statistics Cooperative Program are required to have an error rate of less than 2.0 percent for each item for 3 consecutive data months during the initial qualifying period. Once a State is qualified, NCHS monitors the quality of data received. This was achieved through independent verification of a sample of records for some States as well as comparing the State data with data from previous years. In addition, there is verification at the State level before NCHS is sent the data.

After the coding is completed, counts of the taped records are balanced against control totals for each shipment of records from a registration area. Impossible codes are eliminated during the editing processes on the computer and corrected on the basis of reference to the source record or adjusted by arbitrary code assignment. All subsequent operations involved in tabulation and table preparation are verified during computer processing or by statistical clerks.

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Random variation and significance testing for natality data

The number of births reported for an area is essentially a complete count, since more than 99% of all births are registered. While this number is not subject to sampling error, it may be affected by nonsampling errors such as mistakes in recording the mother's residence or age during the registration process.

When the number of births is used for analytic purposes the number of events that actually occurred can be thought of as one in a large series of possible results that could have occurred under the same circumstances. When considered in this way, the number of births is subject to random variation. The probable range of values may be estimated from the actual figures according to certain statistical assumptions.

The confidence interval is the range of values for the number of births, birth rates, or percent of births that you could expect in 95 out of 100 cases. The confidence limits are the end points of this range of values (the highest and lowest values). Confidence limits tell you how much the number of events or rates could vary under similar circumstances.

Confidence limits for numbers, rates, and percents can be estimated from the actual number of events. Procedures differ for rates and percents and also differ depending on the number of births on which these statistics are based. Below are detailed procedures and examples for each type of case.

95-percent confidence limits for numbers less than 100

When the number of births is less than 100 and the rate is small, the data are assumed to follow a Poisson probability distribution. Confidence limits are estimated using the following formulas:

$$\text{Lower limit} = B \times L$$

$$\text{Upper limit} = B \times U$$

where:

B = the number of births

L = the value in Table C that corresponds to the number B

U = the value in Table C that corresponds to the number B

Example

Suppose the number of first births to American Indian women 40-44 years of age was 47. The confidence limits for this number would be:

$$\begin{aligned} \text{Lower limit} &= B \times L \\ &= 47 \times 0.73476 \\ &= 35 \end{aligned}$$

$$\begin{aligned} \text{Upper limit} &= B \times U \\ &= 47 \times 1.32979 \\ &= 63 \end{aligned}$$

This means that the chances are 95 out of 100 that the actual number of first births to American Indian women 40-44 years of age would lie between 35 and 63.

95-percent confidence limits for numbers of 100 or more

When the number of events is greater than 100, the data are assumed to be approximately normally distributed. Formulas for 95-percent confidence limits are:

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$$\text{Lower limit} = B - (1.96 \times \sqrt{B})$$

$$\text{Upper limit} = B + (1.96 \times \sqrt{B})$$

where:

B = the number of births

Example

Suppose the number of first births to white women 40-44 years of age was 14,108. The 95-percent confidence limits for this number would be:

$$\begin{aligned} \text{Lower limit} &= 14,108 - [1.96 \times \sqrt{14,108}] \\ &= 14,108 - 233 \\ &= 13,875 \end{aligned}$$

$$\begin{aligned} \text{Upper limit} &= 14,108 + [1.96 \times \sqrt{14,108}] \\ &= 14,108 + 233 \\ &= 14,341 \end{aligned}$$

This means that the chances are 95 out of 100 that the actual number of first births to white women 40-44 years of age would lie between 13,875 and 14,341.

Computing confidence intervals for rates

The same statistical assumptions can be used to estimate the variability in birth rates. Again, one formula is used for rates based on numbers of events less than 100, and another formula for rates based on numbers of 100 or greater. For our purposes, assume that the denominators of these rates (the population estimates) have no error. While this assumption is technically correct only for denominators based on the census which occurs every 10 years, the error in intercensal population estimates is usually small, difficult to measure, and therefore not considered.

95-percent confidence limits for rates based on less than 100 events

When the number of events in the numerator is less than 20, an asterisk is shown in place of the rate because there were too few births to compute a statistically reliable rate. When the number of events in the numerator is greater than 20 but less than 100, the confidence interval for a rate can be estimated using the two formulas which follow and the values in Table IV.

$$\text{Lower limit} = R \times L$$

$$\text{Upper limit} = R \times U$$

where:

R = the birth rate

L = the value in Table C that corresponds to the number B in the numerator of the rate

U = the value in Table C that corresponds to the number B in the numerator of the rate

Example

Suppose that the first birth rate for American Indian women 40-44 years of age was 0.54 per thousand, based on 47 births in the numerator. Using Table C:

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$$\begin{aligned} \text{Lower limit} &= 0.54 \times 0.73476 = .40 \\ \text{Upper limit} &= 0.54 \times 1.32979 = .72 \end{aligned}$$

This means that the chances are 95 out of 100 that the actual first birth rate for American Indian women 40-44 year of age lies between .40 and .72.

95-percent confidence limits for rates when the numerator is 100 or more

In this case, use the following formula for the birth rate R based on the number of births B:

$$\begin{aligned} \text{Lower limit} &= R - [1.96 \times \sqrt{R/B}] \\ \text{Upper limit} &= R + [1.96 \times \sqrt{R/B}] \end{aligned}$$

where:

- R = the birth rate
- B = the number of births

Example

Suppose the first birth rate for white women 40-44 years of age was 1.55 per thousand, based on 14,108 births in the numerator. Therefore, the 95-percent confidence interval would be:

$$\begin{aligned} \text{Lower limit} &= 1.55 - [1.96 \times \sqrt{1.55 / 14,108}] \\ &= 1.55 - .026 \\ &= 1.52 \end{aligned}$$

$$\begin{aligned} \text{Upper limit} &= 1.55 + [1.96 \times \sqrt{1.55 / 14,108}] \\ &= 1.55 + .026 \\ &= 1.58 \end{aligned}$$

This means that the chances are 95 out of 100 that the actual first birth rate for white women 40-44 years of age lies between 1.52 and 1.58.

Computing 95-percent confidence intervals for percents

In many instances we need to compute the confidence intervals for percents. Percents derive from a binomial distribution. As with birth rates, an asterisk will be shown for any percent which is based on fewer than 20 births in the numerator. We easily compute a 95-percent confidence interval for a percent when the following conditions are met:

$$\begin{aligned} B \times p &\geq 5 \quad \text{and} \\ B \times q &\geq 5 \end{aligned}$$

where:

- B = number of births in the denominator
- p = percent divided by 100
- q = 1 - p

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For natality data, these conditions will be met except for very rare events in small subgroups. If the conditions are *not* met, the variation in the percent will be so large as to render the confidence intervals meaningless. When these conditions are met the 95-percent confidence interval can be computed using the normal approximation of the binomial. The 95-percent confidence intervals are computed by the following formulas:

$$\begin{aligned} \text{Lower limit} &= p - [1.96 \times (\sqrt{p \times q/B})] \\ \text{Upper limit} &= p + [1.96 \times (\sqrt{p \times q/B})] \end{aligned}$$

where:

$$\begin{aligned} B &= \text{number of births in the denominator} \\ p &= \text{percent divided by 100} \\ q &= 1 - p \end{aligned}$$

Example

Suppose the percent of births to Hispanic women in Alabama that were to unmarried women was 23.0 percent. This was based on 310 births in the numerator and 1,345 births in the denominator. First we test to make sure we can use the normal approximation of the binomial:

$$\begin{aligned} &1,345 \times .230 = 309 \\ &1,345 \times (1 - .230) \\ = &1,345 \times .770 = 1,036 \end{aligned}$$

Both 309 and 1,036 are greater than 5 so we can proceed. The 95-percent confidence interval would be:

$$\begin{aligned} \text{Lower limit} &= .23 - [1.96 \times (\sqrt{.23 \times .77/1,345})] \\ &= .23 - .022 \\ &= .208 \text{ or } 20.8 \text{ percent} \\ \\ \text{Upper limit} &= .23 + [1.96 \times (\sqrt{.23 \times .77/1,345})] \\ &= .23 + .022 \\ &= .252 \text{ or } 25.2 \text{ percent} \end{aligned}$$

This means that the chances are 95 out of 100 that the actual percent of births in Alabama to Hispanic women that are to unmarried women lies between 20.8 and 25.2 percent.

Significance testing

One of the rates is based on fewer than 100 cases

To compare two rates, when one or both of those rates are based on less than 100 cases, you first compute the confidence intervals for both rates. Then you check to see if those intervals overlap. If they **do** overlap, the difference is not statistically significant at the 95-percent level. If they **do not** overlap, the difference is indeed “statistically significant.”

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Example

Is the first birth rate for American Indian women 40-44 years of age (.54 per 1,000) significantly lower than the comparable rate for white women (1.55)? The rate for American Indian women is based on 47 events whereas the rate for white women is based on 14,108 events. The rate for American Indian women is based on less than 100 events; therefore, the first step is to compute the confidence intervals for both rates.

	Lower Limit	Upper Limit
American Indian women	0.40	0.72
White women	1.52	1.58

These two confidence intervals do not overlap. Therefore, the first birth rate for American women 40-44 is significantly lower (at the 95-percent confidence level) than the comparable rate for white women.

Both rates are based on 100 or more events

When both rates are based on 100 or more events, the difference between the two rates is considered statistically significant if it exceeds the statistic in the formula below. This statistic equals 1.96 times the standard error for the difference between two rates.

$$1.96 \sqrt{\frac{R_1^2}{N_1} \% \frac{R_2^2}{N_2}}$$

where:

- R₁ = the first rate
- R₂ = the second rate
- N₁ = the first number of births
- N₂ = the second number of births

If the difference is greater than this statistic, then the difference would occur by chance less than 5 times out of 100. If the difference is less than this statistic, the difference might occur by chance more than 5 times out of 100. We say that the difference is not statistically significant at the 95-percent confidence level.

Example

Is the first birth rate for black women 40-44 years of age (1.08 per 1,000) significantly lower than the comparable rate for white women (1.55)? Both rates are based on more than 100 births (1,535 for black women and 14,108 for white women). The difference between the rates is 1.55 - 1.08 = .47. The statistic is then calculated as follows:

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$$1.96 \sqrt{\frac{1.08^2}{1,535} \% \frac{1.55^2}{14,108}}$$

$$\begin{aligned} &= 1.96 \times /[(1.166/1,535 + 2.403/14,108)] \\ &= 1.96 \times /(.00076+0.00017) \\ &= 1.96 \times /.00093 \\ &= 1.96 \times .03 \\ &= .06 \end{aligned}$$

The difference between the rates (.47) is greater than this statistic (.06). Therefore, the difference is statistically significant at the 95-percent confidence level.

Testing differences between two percents

When testing the difference between two percents, both percents must meet the following conditions:

$$\begin{aligned} B \times p &\geq 5 \quad \text{and} \\ B \times q &\geq 5 \end{aligned}$$

where:

$$\begin{aligned} B &= \text{number of births in the denominator} \\ p &= \text{percent divided by 100} \\ q &= 1 - p \end{aligned}$$

When both percents meet these conditions then the difference between the two percents is considered statistically significant if it exceeds the statistic in the formula below. This statistic equals 1.96 times the standard error for the difference between two percents.

$$1.96 \sqrt{p(1-p) \left(\frac{1}{B_1} \% \frac{1}{B_2} \right)}$$

where:

$$\begin{aligned} B_1 &= \text{the number of births in the denominator for the first percent} \\ B_2 &= \text{the number of births in the denominator for the second percent} \\ p &= \end{aligned}$$

$$\frac{B_1 p_1 \% B_2 p_2}{B_1 \% B_2}$$

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p_1 = the first percent divided by 100
 p_2 = the second percent divided by 100

Example

Is the percent of births to Hispanic women that were to unmarried women higher in Alaska (28.8 percent) than in Alabama (23.0). The number in the denominator was 1,345 in Alabama and 593 in Alaska. The necessary conditions are met for both percents (calculations not shown). The difference between the two percents is $.288 - .230 = .058$. The statistic is then calculated as follows:

$$\begin{aligned} & 1.96 \sqrt{(.2477) (.7523) (.0024)} \\ & = 1.96 \times \sqrt{.000447} \\ & = 1.96 \times .021 \\ & = .042 \end{aligned}$$

The difference between the percents (.058) is greater than this statistic (.042). Therefore, the difference is statistically significant at the 95-percent confidence level.

Computation of rates and other measures

Population bases

The rates shown in this report were computed on the basis of population statistics prepared by the U.S. Bureau of the Census. Rates for 1940, 1950, 1960, 1970, 1980, and 1990 are based on the population enumerated as of April 1 in the censuses of those years. Rates for all other years are based on the estimated midyear (July 1) population for the respective years. Birth rates for the United States, individual States, and metropolitan areas are based on the total resident populations of the respective areas. Except as noted these populations exclude the Armed Forces abroad but include the Armed Forces stationed in each area. The resident population of the birth- and death-registration States for 1900-32 and for the United States for 1900-98 is shown in table 4-1. In addition, the population including Armed Forces abroad is shown for the United States. Table D shows the sources for these populations.

In both the 1980 and 1990 censuses, a substantial number of persons did not specify a racial group that could be classified as any of the White, Black, American Indian, Eskimo, Aleut, Asian, or Pacific Islander categories on the census form (18). In 1980 the number of persons of "other" race was 6,758,319; in 1990 it was 9,804,847. In both censuses, the large majority of these persons were of Hispanic origin (based on response to a separate question on the form), and many wrote in their Hispanic origin, or Hispanic origin type (for example, Mexican, Puerto Rican) as their race. In both 1980 and 1990, persons of unspecified race were allocated to one of the four tabulated racial groups (white, black, American Indian, Asian or Pacific Islander), based on their response to the Hispanic origin question. These four race categories conform with the 1979 edition of OMB Directive 15 which mandates that race data must

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contain at least these 4 categories. These categories are also more consistent with the race categories in vital statistics.

In the allocation of unspecified race was carried out using cross-tabulations of age, sex, race, type of Hispanic origin, and county of residence. Persons of Hispanic origin and unspecified race were allocated to either white or black, based on their Hispanic origin type. Persons of "other" race and Mexican origin were categorically assumed to be white, while persons in other Hispanic categories were distributed to white and black pro rata within the county-age-sex group. For "other-not-specified" persons who were not Hispanic, race was allocated to white, black, or Asian and Pacific Islander, based on proportions gleaned from sample data. The 20-percent sample (respondents who were enumerated on the longer census form) provided a highly detailed coding of race, which allowed identification of otherwise unidentifiable responses with a specified race category. Allocation proportions were thus established at the State level, which were used to distribute the non-Hispanic persons of "other" race in the 100-percent tabulations.

In 1990 the race modification procedure was carried out using individual census records. Persons whose race could not be specified were assigned to a racial category using a pool of "race donors," which was derived from persons of specified race and the identical response to the Hispanic origin question within the auspices of the same Census District Office. As in 1980, the underlying assumption was that the Hispanic origin response was the major criterion for allocating race. Unlike 1980, persons of Hispanic origin, including Mexican, could be assigned to any racial group, rather than white or black only, and the non-Hispanic component of "other" race was allocated primarily on the basis of geography (District Office), rather than detailed characteristic.

The means by which respondent's age was determined were fundamentally different in the two censuses; therefore, the problems that necessitated the modification were different. In 1980 respondents reported year of birth and quarter of birth (within year) on the census form. When census results were tabulated, persons born in the first quarter of the year (before April 1) had age equal to 1980 minus year of birth, while persons born in the last three quarters had age equal to 1979 minus year of birth.

In 1990 the quarter year of birth was not reported on the census form, so that direct determination of age from year of birth was impossible. In 1990 census publications age is based on respondents' direct reports of age at last birthday. This definition proved inadequate for postcensal estimates, because it was apparent that many respondents had reported their age at time of either completion of the census form or interview by an enumerator, which could occur several months after the April 1 reference data. As a result, age was biased upward. Modification was based on a respecification of age, for most individual respondents, by year of birth, with allocation to first quarter (persons aged 1990 minus year of birth) and last three quarters (aged 1989 minus year of birth) based on a historical series of registered births by month. This process partially restored the 1980 logic for assignment of age. It was not considered necessary to correct for age overstatement and heaping in 1990, because the availability of age and year of birth on the census form provided elimination of spurious year-of-birth reports in the census data before modification occurred.

Populations for 1998--The population of the United States by age, sex, race, and Hispanic origin is shown in the Census Bureau report United States population estimates, by age, sex, race, and Hispanic origin: 1990 to 1998. Washington, DC: U.S. Bureau of the Census, <http://www.census.gov/population/www/estimates/uspop.html> Internet release, June 4, 1999.

Populations for 1997--The population of the United States by age, sex, race, and Hispanic origin is shown in the Census Bureau report United States population estimates, by age, sex, race, and Hispanic origin: 1990 to 1997. PPL-91R.U.S. Bureau of the Census. Rounded populations are consistent with U.S. Bureau of the Census file NESTV97. Washington: U.S. Department of Commerce. 1998.

Populations for 1996--The population of the United States by age, sex, race, and Hispanic origin is shown in the Census Bureau report, United States population estimates by age, sex, race and Hispanic origin: 1990 to 1996. U.S. Bureau of the Census. PPL-57. Washington: U.S. Department of Commerce. 1997.

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Populations for 1995--The population of the United States by age, sex, race, and Hispanic origin is shown in the Census Bureau report, United States population estimates by age, sex, race and Hispanic origin: 1990 to 1995. U.S. Bureau of the Census. Census file RESDO795, PPL-41. Washington: U.S. Department of Commerce. 1996.

Populations for 1994--The population of the United States by age, sex, race, and Hispanic origin is shown in the Census Bureau report, United States population estimates by age, sex, race and Hispanic origin: 1990 to 1994. U.S. Bureau of the Census. PPL-21. Washington: U.S. Department of Commerce. 1995.

Populations for 1993--The population of the United States by age, sex, race and Hispanic origin is tabulated from Census file RESO793.

Populations for 1992--The population of the United States by age, sex, race and Hispanic origin is tabulated from census file RESPO792.

Populations for 1991--The population of the United States by age, race, and sex is shown in *Current Population Reports*, Series P-25, Number 1095. Monthly population figures were published in *Current Population Reports*, Series P-25, Number 1097.

Populations for 1990--The population of the United States by age, race, and sex, and the population for each State is shown in *Current Population Reports*, Series P-25, Number 1095. The figures have been modified as described above. Monthly population figures were published in *Current Population Reports*, Series P-25, Number 1094.

Population estimates for 1981-89--Birth rates for 1981-89 (except those for cohorts of women) have been revised, based on revised population estimates that are consistent with the 1990 census levels, and thus may differ from rates published in volumes of *Vital Statistics of the United States* for these years. The 1990 census counted approximately 1.5 million fewer persons than had earlier been estimated for April 1, 1990. The revised estimates for the United States by age, race, and sex were published by the U.S. Bureau of the Census in *Current Population Reports*, Series P-25, Number 1095. Population estimates by month are based on data published in *Current Population Reports*, Series P-25, Number 1094 and unpublished data. Unpublished revised estimates for States were obtained from the U.S. Bureau of the Census.

Populations for 1980--The population of the United States by age, race, and sex, and the population for each State are shown in tables 4-2 and 4-3 of volume I, *Vital Statistics of the United States*, 1980. The figures by race have been modified as described above. Monthly population figures were published in *Current Population Reports*, Series P-25, Number 899.

Population estimates for 1971-79--Birth rates for 1971-79 (except those for cohorts of women) have been revised, based on revised population estimates that are consistent with the 1980 census levels, and thus may differ from rates published in volumes of *Vital Statistics of the United States* for these years. The 1980 census counted approximately 5.5 million more persons than had earlier been estimated for April 1, 1980 (19). The revised estimates for the United States by age, race, and sex were published by the U.S. Bureau of the Census in *Current Population Reports*, Series P-25, Number 917. Population estimates by month are based on data published in *Current Population Reports*, Series P-25, Number 899. Unpublished revised estimates for States were obtained from the U.S. Bureau of the Census.

Population estimates for 1961-69--Birth rates for 1961-69 are based on revised estimates of the population and thus may differ slightly from rates published before 1976. The revised estimates used in computing these rates were published in *Current Population Reports*, Series P-25, Number 519. The rates for 1961-64 are based on revised estimates of the population published in *Current Population Reports*, Series P-25, Numbers 321 and 324 and may differ slightly from rates published in those years.

Population estimates for 1951-59--Final intercensal estimates of the population by age, race, and sex and total population by State for 1951-59 are shown in tables 4-4 and 4-5 of volume I, *Vital Statistics of the United States*, 1966. Beginning with 1963 these final estimates have been used to compute birth rates for 1951-59 in all issues of *Vital Statistics of the United States*.

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Net census undercounts and overcounts

The U.S. Bureau of the Census has conducted extensive research to evaluate the coverage of the U.S. population (including undercount, overcount, and misstatement of age, race, and sex) in the last five decennial censuses 1950, 1960, 1970, 1980, and 1990. These studies provide estimates of the national population, that were not enumerated or over enumerated in the respective censuses, by age, race, and sex (19-21). The report for 1990 (22) includes estimates of net under enumeration and over enumeration for age, sex, and racial subgroups of the national population, modified for race consistency with previous population counts as described in the section "Population bases."

These studies indicate that there are differential coverages in the censuses among the population subgroups; that is, some age, race, and sex groups are more completely enumerated than others. To the extent that these estimates of overcounts or undercounts are valid, that they are substantial, and that they vary among subgroups and geographic areas, census miscounts can have consequences for vital statistics measures (20). However, the effects of undercounts in the census are reduced to the extent that there is underregistration of births. If these two factors are of equal magnitude, rates based on unadjusted populations are more accurate than those based on adjusted populations because the births have not been adjusted for underregistration.

The impact of net census miscounts on vital statistics measures includes the effects on levels of the rates and effects on differentials among groups.

If adjustments were made for persons who were not counted in the census of population, the size of the denominators would generally increase and the rates would be smaller than without an adjustment. Adjusted rates for 1990 can be computed by multiplying the reported rates by ratios of the 1990 census-level population adjusted for the estimated net census miscounts, which are shown in table E. A ratio of less than 1.0 indicates a net census undercount and would result in a corresponding decrease in the rate. A ratio in excess of 1.0 indicates a net census overcount and would result in a corresponding increase in the rate.

Enumeration of white females in the childbearing ages was at least 97 percent complete for all ages. Among black women, the undercount ranged up to 5 percent. Generally, females in the childbearing ages were more completely enumerated than males for similar race-age groups.

If vital statistics measures were calculated with adjustments for net census miscounts for each of these subgroups, the resulting rates would have been differentially changed from their original levels; that is, rates for those groups with the greatest estimated overcounts or undercounts would show the greatest relative changes due to these adjustments. Thus the racial differential in fertility between the white and the "All other" population can be affected by such adjustments.

Cohort fertility tables

The various fertility measures shown for cohorts of women are computed from births adjusted for underregistration and population estimates corrected for under enumeration and misstatement of age. Data published after 1974 use revised population estimates prepared by the U.S. Bureau of the Census and have been expanded to include data for the two major racial groups. Heuser has prepared a detailed description of the methods used in deriving these measures as well as more detailed data for earlier years (23).

Parity distribution--The percent distribution of women by parity (number of children ever born alive to mother) is derived from cumulative birth rates by order of birth. The percent of zero-parity women is found by subtracting the cumulative first birth rate from 1,000 and dividing by 10. The proportions of women at parities one through six are found from the following formula:

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Percent at N parity = (cum. rate, order N) - (cum. rate, order N + 1)/10

The percent of women at seventh and higher parities is found by dividing the cumulative rate for seventh-order births by 10.

Birth probabilities--birth probabilities indicate the likelihood that a woman of a certain parity and age at the beginning of the year will have a child during the year. Birth probabilities differ from central birth rates in that the denominator for birth probabilities is specific for parity as well as for age.

Age-sex-adjusted birth rates

The age-sex-adjusted birth rates are computed by the direct method. The age distribution of women aged 10-49 years as enumerated in 1940 and the total population of the United States for that year are used as the standard populations. The age-sex-adjusted birth rates show differences in the level of fertility independent of differences in the age and sex composition of the population. It is important not to confuse these adjusted rates with the crude rates shown in other tables.

Total fertility rate

The total fertility rate is the sum of the birth rates by age of mother (in 5-year age groups) multiplied by 5. It is an age-adjusted rate because it is based on the assumption that there are the same number of women in each age group. The rate of 2,058.5 in 1998, for example, means that if a hypothetical group of 1,000 women were to have the same birth rates in each age group that were observed in the actual childbearing population in 1998, they would have a total of 2,058.5 children by the time they reached the end of the reproductive period (taken here to be age 55 years), assuming that all of the women survived to that age.

Intrinsic vital rates

The intrinsic vital rates are calculated from a stable population. A stable population is that hypothetical population, closed to external migration, that would become fixed in age-sex structure after repeated applications of a constant set of age-sex specific birth and death rates. For the mathematical derivation of intrinsic vital rates, see pages 4-13 and 4-14 in the Technical Appendix of volume I, Vital Statistics of the United States, 1962. The technique of calculating intrinsic vital rates is described by Barclay (24).

Seasonal adjustment of rates

The seasonally adjusted birth and fertility rates are computed from the X-11 variant of Census Method II (25). This method of seasonal adjustment used since 1964 differs slightly from the U.S. Bureau of Labor Statistics (BLS) Seasonal Factor Method, which was used for Vital Statistics of the United States, 1964. The fundamental technique is the same in that it is an adaptation of the ratio-to-moving-average method. Before 1964 the method of seasonal adjustment was based on the X-9 variant and other variants of Census Method II. A comparison of the Census Method II with the BLS Seasonal Factor Method shows the differences in the seasonal patterns of births to be negligible.

VITAL STATISTICS OF THE UNITED STATES: NATALITY, 1998
TECHNICAL APPENDIX

Computation of percents, medians, and means

Percent distributions, medians, and means are computed using only events for which the characteristic is reported. The "Not stated" category is subtracted from the total before computation of these measures. The asterisk (*) indicates that the numerator and/or denominator number is less than 20.

VITAL STATISTICS OF THE UNITED STATES: NATALITY, 1998
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TYPE/PRINT
IN
PERMANENT
BLACK INK
FOR
INSTRUCTIONS
SEE
HANDBOOK

**U.S. STANDARD
CERTIFICATE OF LIVE BIRTH**

LOCAL FILE NUMBER

BIRTH NUMBER

CHILD

1. CHILD'S NAME (First, Middle, Last)		2. DATE OF BIRTH (Month, Day, Year)	3. TIME OF BIRTH
4. SEX	5. CITY, TOWN, OR LOCATION OF BIRTH		6. COUNTY OF BIRTH
7. PLACE OF BIRTH: <input type="checkbox"/> Hospital <input type="checkbox"/> Freestanding Birthing Center <input type="checkbox"/> Clinic/Doctor's Office <input type="checkbox"/> Residence <input type="checkbox"/> Other (Specify) _____		8. FACILITY NAME (If not institution, give street and number)	

**CERTIFIER/
ATTENDANT**

DEATH UNDER
ONE YEAR OF
AGE
Enter State File
Number of death
certificate for
this child

9. I certify that this child was born alive at the place and time and on the date stated. Signature _____	10. DATE SIGNED (Month, Day, Year)	11. ATTENDANT'S NAME AND TITLE (If other than certifier) (Type/Print) Name _____ <input type="checkbox"/> M.D. <input type="checkbox"/> D.O. <input type="checkbox"/> C.N.M. <input type="checkbox"/> Other Midwife <input type="checkbox"/> Other (Specify) _____
12. CERTIFIER'S NAME AND TITLE (Type/Print) Name _____ <input type="checkbox"/> M.D. <input type="checkbox"/> D.O. <input type="checkbox"/> Hospital Admin. <input type="checkbox"/> C.N.M. <input type="checkbox"/> Other Midwife <input type="checkbox"/> Other (Specify) _____		13. ATTENDANT'S MAILING ADDRESS (Street and Number or Rural Route Number, City or Town, State, Zip Code)

MOTHER

14. REGISTRAR'S SIGNATURE _____		15. DATE FILED BY REGISTRAR (Month, Day, Year)	
16a. MOTHER'S NAME (First, Middle, Last)		16b. MAIDEN SURNAME	17. DATE OF BIRTH (Month, Day, Year)
18. BIRTHPLACE (State or Foreign Country)	19a. RESIDENCE—STATE	19b. COUNTY	19c. CITY, TOWN, OR LOCATION
19d. STREET AND NUMBER		19e. INSIDE CITY LIMITS? (Yes or no)	20. MOTHER'S MAILING ADDRESS (If same as residence, enter Zip Code on _____)

FATHER

21. FATHER'S NAME (First, Middle, Last)	22. DATE OF BIRTH (Month, Day, Year)	23. BIRTHPLACE (State or Foreign Country)
---	--------------------------------------	---

INFORMANT

24. I certify that the personal information provided on this certificate is correct to the best of my knowledge and belief. Signature of Parent or Other Informant _____

INFORMATION FOR MEDICAL AND HEALTH USE ONLY

MOTHER

FATHER

25. OF HISPANIC ORIGIN? (Specify No or Yes—If yes, specify Cuban, Mexican, Puerto Rican, etc.)		26. RACE—American Indian, Black, White, etc. (Specify below)		27. EDUCATION (Specify only highest grade completed) Elementary/Secondary (0-12) | College (1-4 or 5+)	
25a. <input type="checkbox"/> No <input type="checkbox"/> Yes Specify: _____		26a. _____		27a. _____	
25b. <input type="checkbox"/> No <input type="checkbox"/> Yes Specify: _____		26b. _____		27b. _____	
28. PREGNANCY HISTORY (Complete each section)			29. MOTHER MARRIED? (At birth, conception, or any time between) (Yes or no)		30. DATE LAST NORMAL MENSTRUATION BEGAN (Month, Day, Year)
LIVE BIRTHS (Do not include this child)		OTHER TERMINATIONS (Spontaneous and induced at any time after conception)		31. MONTH OF PREGNANCY PRENATAL CARE BEGAN—First, Second, Third, etc. (Specify)	
28a. Now Living Number _____ <input type="checkbox"/> None	28b. Now Dead Number _____ <input type="checkbox"/> None	28d. _____ <input type="checkbox"/> None		32. PRENATAL VISITS—Total Number (If none, so state)	
28c. DATE OF LAST LIVE BIRTH (Month, Year)		28e. DATE OF LAST OTHER TERMINATION (Month, Year)		33. BIRTH WEIGHT (Specify unit)	
36. APGAR SCORE		37a. MOTHER TRANSFERRED PRIOR TO DELIVERY? <input type="checkbox"/> No <input type="checkbox"/> Yes If Yes, enter name of facility transferred from: _____			
36a. 1 Minute		36b. 5 Minutes		37b. INFANT TRANSFERRED? <input type="checkbox"/> No <input type="checkbox"/> Yes If Yes, enter name of facility transferred to: _____	
35a. PLURALITY—Single, Twin, Triplet, etc. (Specify)		35b. IF NOT SINGLE BIRTH—Born First, Second, Third, etc. (Specify)			

MULTIPLE BIRTHS
Enter State File
Number for Mate(s)
LIVE BIRTH(S)

FETAL DEATH(S)

38a. MEDICAL RISK FACTORS FOR THIS PREGNANCY
(Check all that apply)

Anemia (Hct. <30/Hgb. <10)	01	<input type="checkbox"/>
Cardiac disease	02	<input type="checkbox"/>
Acute or chronic lung disease	03	<input type="checkbox"/>
Diabetes	04	<input type="checkbox"/>
Genital herpes	05	<input type="checkbox"/>
Hydramnios/Oligohydramnios	06	<input type="checkbox"/>
Hemoglobinopathy	07	<input type="checkbox"/>
Hypertension, chronic	08	<input type="checkbox"/>
Hypertension, pregnancy-associated	09	<input type="checkbox"/>
Eclampsia	10	<input type="checkbox"/>
Incompetent cervix	11	<input type="checkbox"/>
Previous infant 4000+ grams	12	<input type="checkbox"/>
Previous preterm or small-for-gestational-age infant	13	<input type="checkbox"/>
Renal disease	14	<input type="checkbox"/>
Rh sensitization	15	<input type="checkbox"/>
Uterine bleeding	16	<input type="checkbox"/>
None	00	<input type="checkbox"/>
Other _____	17	<input type="checkbox"/>

(Specify)

38b. OTHER RISK FACTORS FOR THIS PREGNANCY
(Complete all items)

Tobacco use during pregnancy Yes No
Average number cigarettes per day _____

Alcohol use during pregnancy Yes No
Average number drinks per week _____

Weight gained during pregnancy _____ lbs.

39. OBSTETRIC PROCEDURES
(Check all that apply)

Amniocentesis	01	<input type="checkbox"/>
Electronic fetal monitoring	02	<input type="checkbox"/>
Induction of labor	03	<input type="checkbox"/>
Stimulation of labor	04	<input type="checkbox"/>
Tocolysis	05	<input type="checkbox"/>
Ultrasound	06	<input type="checkbox"/>
None	00	<input type="checkbox"/>
Other _____	07	<input type="checkbox"/>

(Specify)

40. COMPLICATIONS OF LABOR AND/OR DELIVERY
(Check all that apply)

Febrile (>100°F. or 38°C.)	01	<input type="checkbox"/>
Meconium, moderate/heavy	02	<input type="checkbox"/>
Premature rupture of membrane (>12 hours)	03	<input type="checkbox"/>
Abruptio placenta	04	<input type="checkbox"/>
Placenta previa	05	<input type="checkbox"/>
Other excessive bleeding	06	<input type="checkbox"/>
Seizures during labor	07	<input type="checkbox"/>
Precipitous labor (<3 hours)	08	<input type="checkbox"/>
Prolonged labor (>20 hours)	09	<input type="checkbox"/>
Dysfunctional labor	10	<input type="checkbox"/>
Breech/Malpresentation	11	<input type="checkbox"/>
Cephalopelvic disproportion	12	<input type="checkbox"/>
Cord prolapse	13	<input type="checkbox"/>
Anesthetic complications	14	<input type="checkbox"/>
Fetal distress	15	<input type="checkbox"/>
None	00	<input type="checkbox"/>
Other _____	16	<input type="checkbox"/>

(Specify)

41. METHOD OF DELIVERY (Check all that apply)

Vaginal	01	<input type="checkbox"/>
Vaginal birth after previous C-section	02	<input type="checkbox"/>
Primary C-section	03	<input type="checkbox"/>
Repeat C-section	04	<input type="checkbox"/>
Forceps	05	<input type="checkbox"/>
Vacuum	06	<input type="checkbox"/>

42. ABNORMAL CONDITIONS OF THE NEWBORN
(Check all that apply)

Anemia (Hct. <39/Hgb. <13)	01	<input type="checkbox"/>
Birth injury	02	<input type="checkbox"/>
Fetal alcohol syndrome	03	<input type="checkbox"/>
Hyaline membrane disease/RDS	04	<input type="checkbox"/>
Meconium aspiration syndrome	05	<input type="checkbox"/>
Assisted ventilation <30 min	06	<input type="checkbox"/>
Assisted ventilation ≥30 min	07	<input type="checkbox"/>
Seizures	08	<input type="checkbox"/>
None	00	<input type="checkbox"/>
Other _____	09	<input type="checkbox"/>

(Specify)

43. CONGENITAL ANOMALIES OF CHILD
(Check all that apply)

Anencephalus	01	<input type="checkbox"/>
Spina bifida/Meningocele	02	<input type="checkbox"/>
Hydrocephalus	03	<input type="checkbox"/>
Microcephalus	04	<input type="checkbox"/>
Other central nervous system anomalies (Specify) _____	05	<input type="checkbox"/>
Heart malformations	06	<input type="checkbox"/>
Other circulatory/respiratory anomalies (Specify) _____	07	<input type="checkbox"/>
Rectal atresia/stenosis	08	<input type="checkbox"/>
Tracheo-esophageal fistula/ Esophageal atresia	09	<input type="checkbox"/>
Omphalocele/ Gastroschisis	10	<input type="checkbox"/>
Other gastrointestinal anomalies (Specify) _____	11	<input type="checkbox"/>
Malformed genitalia	12	<input type="checkbox"/>
Renal agenesis	13	<input type="checkbox"/>
Other urogenital anomalies (Specify) _____	14	<input type="checkbox"/>
Cleft lip/palate	15	<input type="checkbox"/>
Polydactyly/Syndactyly/Adactyly	16	<input type="checkbox"/>
Club foot	17	<input type="checkbox"/>
Diaphragmatic hernia	18	<input type="checkbox"/>
Other musculoskeletal/integumental anomalies (Specify) _____	19	<input type="checkbox"/>
Down's syndrome	20	<input type="checkbox"/>
Other chromosomal anomalies (Specify) _____	21	<input type="checkbox"/>
None	00	<input type="checkbox"/>
Other _____	22	<input type="checkbox"/>

(Specify)

Table A. Percent of birth records on which specified items were not stated: United States each State, and Territory, 1998

(Page 1 of 2)
[By place of residence]

Area	Number of births	Place of birth	Attendant at birth	Mother's birth-place	Father's age	Father's race	Hispanic Origin		Educational attainment Mother	Live-birth order	Length of Gestation	Month prenatal care began	Number of prenatal visits
							Mother	Father					
Total of reporting areas 1/	3,941,553	0.0	0.0	0.3	14.4	14.8	1.2	15.3	1.5	0.7	1.0	2.8	3.6
Alabama	62,074	-	-	0.0	23.8	23.8	.0	23.8	0.3	0.0	0.1	0.3	0.3
Alaska	9,926	.0	.0	.2	12.9	14.7	.5	13.7	2.0	.2	.3	1.7	1.5
Arizona	78,243	-	.0	.3	21.5	23.3	1.3	23.6	2.0	.4	.2	2.1	3.6
Arkansas	36,865	.0	.0	.4	20.6	21.8	.1	21.0	.9	.2	.3	2.4	3.3
California	521,661	.0	.1	.3	7.4	6.8	.7	6.3	1.7	.1	2/ 5.4	1.6	2.9
Colorado	59,577	-	-	.2	9.6	10.2	.0	10.3	1.4	.0	.0	.7	.9
Connecticut	43,820	.0	.0	.4	9.4	10.8	5.3	14.4	3.9	8.3	.1	5.4	9.0
Delaware	10,578	.0	.0	.3	30.7	31.6	.3	30.7	.7	.3	.1	.9	1.1
District of Columbia	7,686	-	-	.0	44.9	51.3	.5	44.7	9.0	.2	.4	15.3	18.6
Florida	195,637	.0	-	.2	17.6	17.7	.1	19.1	.4	.0	.1	.8	1.7
Georgia	122,368	.0	.0	.2	18.0	18.4	.8	18.6	2.0	.3	.1	2.9	2.7
Hawaii	17,583	-	.0	.1	8.4	8.6	.1	8.4	.4	.0	10.4	5.3	6.1
Idaho	19,391	.0	.0	.3	8.6	11.2	1.5	11.4	4.2	1.3	.6	2.2	2.6
Illinois	182,588	.0	.0	.1	15.5	16.8	.0	16.8	.8	.2	.2	1.8	2.2
Indiana	85,122	.3	.1	.2	13.5	13.7	.4	13.7	.9	.4	.1	1.5	2.6
Iowa	37,282	.0	.0	.4	12.1	14.2	1.1	15.0	1.5	.1	.1	1.3	3.9
Kansas	38,422	.0	.0	.1	10.6	10.7	1.0	12.1	.4	.0	.1	.6	.8
Kentucky	54,329	.0	.1	.0	22.0	22.7	.1	23.7	.2	.1	.1	1.1	1.3
Louisiana	66,888	-	.0	.0	22.3	22.5	.2	22.5	.1	.0	.0	.3	.5
Maine	13,733	-	.0	-	10.0	15.0	4.3	18.7	.8	.3	.1	.5	.5
Maryland	71,972	.0	.0	.7	8.4	10.1	.6	6.8	2.0	1.6	.5	4.7	8.2
Massachusetts	81,411	.0	.0	.0	7.8	7.6	.4	6.8	.3	.2	.2	.9	.3
Michigan	133,666	.0	.2	.1	16.0	18.0	5.4	22.5	1.4	.6	.1	3.9	5.4
Minnesota	65,202	.0	.0	.0	8.9	11.3	5.2	15.4	2.2	.5	1.0	5.6	5.0
Mississippi	42,939	.0	.0	.1	24.2	24.0	.1	24.3	.2	.1	.2	.6	1.1
Missouri	75,358	.0	.0	.2	18.3	18.3	.1	18.5	.8	.3	.2	1.4	2.0
Montana	10,795	.0	.1	-	10.2	11.5	2.0	13.4	.4	.0	.1	.5	.5
Nebraska	23,534	.0	.0	.0	12.2	12.8	2.2	14.4	.1	.0	.0	.3	.6
Nevada	28,699	-	.0	.8	22.4	23.3	.7	22.0	3.2	1.1	1.1	6.2	10.0
New Hampshire	14,429	-	-	.0	7.2	9.1	3.5	11.6	.8	2.8	.2	1.7	1.8
New Jersey	114,550	.1	.1	.2	8.9	11.1	.4	9.4	2.3	.2	.2	5.0	6.0
New Mexico	27,318	.0	.0	2.8	27.5	26.8	.0	26.8	5.1	.5	.7	5.7	5.5
New York	258,207	.1	.1	.4	15.7	16.1	6.2	20.8	1.7	.1	.2	10.0	6.7
North Carolina	111,688	.0	.0	.0	17.2	17.2	.0	17.1	.2	.0	.1	.5	.5
North Dakota	7,932	-	-	.0	7.9	9.4	3.1	12.3	.2	-	.1	.6	.3
Ohio	152,794	.0	.0	.2	15.2	16.0	.4	15.8	.5	.2	.0	.5	1.5
Oklahoma	49,461	.0	.1	.1	17.0	18.9	1.1	18.8	2.0	12.2	3.2	10.9	12.8
Oregon	45,273	-	-	.1	11.6	4.6	.2	4.9	1.2	.1	.0	.4	.5
Pennsylvania	145,899	.0	.0	.8	5.7	4.3	.6	3.8	2.3	.4	.2	3.2	4.8
Rhode Island	12,599	-	-	.3	13.6	14.2	12.8	23.1	2.9	2.2	2.6	8.8	9.8
South Carolina	53,877	-	.0	.3	28.8	28.9	.1	28.8	4.6	.1	.2	1.5	1.6
South Dakota	10,288	.0	-	.0	11.8	12.1	.1	13.3	.2	-	.0	.4	.4
Tennessee	77,396	.0	.0	.0	16.1	16.2	.0	16.3	.2	.0	.2	1.1	.9
Texas	342,283	.0	.0	.4	15.3	15.4	.3	15.4	1.3	1.2	.6	2.0	5.2
Utah	45,165	.0	.0	.2	9.7	10.8	.3	9.3	.9	.2	.1	2.9	3.0
Vermont	6,582	.0	-	.1	9.1	15.3	2.6	16.4	2.5	.4	.2	3.6	1.2
Virginia	94,351	.0	.1	.1	17.8	18.6	.1	18.5	.5	1.1	.3	.6	1.2
Washington	79,663	.0	.0	.8	11.8	12.0	3.2	12.3	10.6	4.5	1.0	9.7	13.1
West Virgin	20,747	.1	.0	.1	13.3	14.2	.2	14.6	.5	.2	.5	4.3	3.2
Wisconsin	67,450	-	-	.0	28.4	28.4	.0	28.4	.1	.0	.0	.2	.3
Wyoming	6,252	.0	-	.0	13.6	14.0	.1	13.9	.4	.0	.1	.5	.5
Puerto Rico	60,412	-	.1	-	2.9	3.4	...	...	.2	.0	.1	.2	.1
Virgin Islands	1,800	.1	.6	-	21.6	24.3	3.2	26.4	1.7	.9	.8	.6	1.7
Guam	4,318	.1	.5	.1	23.6	24.9	.4	23.3	.6	.6	.2	.8	1.2
American Samoa	1,688	.1	-	5.9	34.2	34.8	...	...	...	-	...	...	...
Northern Marianas	1,462	.2	1.0	0.3	9.6	24.4	...	...	25.0	23.1	26.3	56.5	25.0

See footnotes at end of table.

Table A. Percent of birth records on which specified items were not stated: United States each State, and Territory, 1998

(Page 2 of 2)
[By place of residence]

Area	Number of births	Birth weight	5-minute Apgar score *	Medical risk factors	Tobacco use	Alcohol use	Weight gain	Obstetric procedures	Complications of labor and/or delivery	* Method of delivery	Abnormal conditions of newborn	Congenital anomalies
Total of reporting areas 1/	3,941,553	0.1	0.6	1.4	1.5	1.5	8.3	0.9	1.2	0.9	2.4	1.7
Alabama	62,074	0.0	0.2	3/ 0.0	0.0	0.1	3.1	0.0	0.0	0.3	0.0	0.1
Alaska	9,926	.2	.6	.3	.6	.6	1.6	.3	.3	.4	.4	.3
Arizona	78,243	.1	.6	.0	1.8	2.0	11.3	.0	.0	.2	.0	.4
Arkansas	36,865	.1	3.6	.5	.9	1.0	9.5	.4	.5	.7	.4	.4
California	521,661	.0	...	.0	...	...	...	.0	.0	.0	.0	.0
Colorado	59,577	.0	.3	.0	.1	.1	3.4	.0	.0	.0	.0	.1
Connecticut	43,820	.0	1.5	11.8	8.1	7.4	18.6	10.4	12.2	4.5	18.9	20.1
Delaware	10,578	.0	.4	.0	.2	.2	1.9	.0	.0	.0	.1	.1
District of Columbia	7,686	.1	1.1	.0	.1	.1	16.4	.0	.0	.0	.0	.0
Florida	195,637	.1	.2	.0	.1	.1	4.4	.0	.0	.6	.0	.0
Georgia	122,368	.0	.5	.4	.4	.4	5.6	.0	.0	.3	.0	.0
Hawaii	17,583	2.8	7.2	16.2	.1	.1	13.8	9.7	7.3	16.5	17.2	18.9
Idaho	19,391	.3	.6	1.0	.7	1.0	10.2	.9	.9	.3	.7	.7
Illinois	182,588	.1	.3	.1	1.0	.2	3.9	.0	.1	.4	.1	.1
Indiana	85,122	.5	.5	.1	...	.4	3.2	.1	.2	.4	.6	.6
Iowa	37,282	.1	.3	.2	3.3	3.8	6.9	.1	.3	.4	.3	.4
Kansas	38,422	.0	.4	3/ .5	.5	.5	.7	.4	.4	2.9	.4	.4
Kentucky	54,329	.1	.4	6.1	4.5	4.5	8.6	3.9	6.5	4.1	11.3	10.3
Louisiana	66,888	.1	.3	.0	.1	.1	6.8	.0	.1	.1	.1	.0
Maine	13,733	.1	.2	.1	1.1	1.4	1.8	.0	.1	.2	.1	.2
Maryland	71,972	.1	.5	.0	.5	.7	8.3	.0	.0	.2	.0	.0
Massachusetts	81,411	.2	.3	.6	.3	.3	1.1	.6	.6	.4	1.0	1.0
Michigan	133,666	.3	.4	.1	1.8	1.5	9.4	.1	.1	.6	.1	.1
Minnesota	65,202	.1	.8	8.3	7.2	7.3	18.1	6.5	7.6	4.5	8.2	8.5
Mississippi	42,939	.0	.4	.1	.2	.2	4.6	.1	.1	.2	.1	.1
Missouri	75,358	.0	.5	.1	.4	.4	3.0	.1	.1	.7	.1	.1
Montana	10,795	.0	.4	.1	.8	1.5	1.4	.1	.1	.5	.2	.1
Nebraska	23,534	.0	.2	.0	.9	.9	1.3	.0	.0	.2	6/ .0	.0
Nevada	28,699	.1	1.7	10.7	2.2	2.5	11.8	.5	6.6	1.5	12.4	12.5
New Hampshire	14,429	.1	.3	.0	.2	.3	5.5	.0	.0	.2	.1	.1
New Jersey	114,550	.1	.2	2.3	1.0	1.0	6.1	.1	1.6	.5	26.2	1.7
New Mexico	27,318	1.6	4.0	.1	2.0	2.1	11.3	.0	.0	.4	.1	...
New York	258,207	.1	.2	1.1	4/ 4.3	.2	9.6	.2	.4	.3	7/ 0.9	1.0
North Carolina	111,688	.0	.3	.0	.1	.1	2.3	.0	.0	.4	.0	.4
North Dakota	7,932	.1	.4	.1	.6	.7	1.3	.1	.1	1.0	.1	.1
Ohio	152,794	.1	.2	.0	.3	.1	2.6	.0	.0	.4	.0	.0
Oklahoma	49,461	.6	5.5	34.0	23.9	24.2	34.6	30.2	33.0	26.9	39.5	40.3
Oregon	45,273	.0	.4	.5	.7	.7	3.0	.0	.0	.2	.0	.0
Pennsylvania	145,899	.1	.3	.1	.9	.6	8.3	.0	.1	.1	.6	.5
Rhode Island	12,599	.4	.7	8.4	2.7	2.9	12.0	8.3	8.4	.7	18.9	19.3
South Carolina	53,877	.0	.4	.0	.1	.1	2.6	.0	.0	.5	.0	.0
South Dakota	10,288	.0	.3	.0	...	...	1.4	.0	.0	.2	.0	.0
Tennessee	77,396	.0	.3	.0	.2	.2	6.1	.0	.1	.4	.1	.0
Texas	342,283	.1	...	5/ 1.3	.4	.5	19.6	.1	8/ .1	.7	6/ .2	.3
Utah	45,165	.0	.3	.1	.5	.4	4.1	.0	.0	.0	.2	.4
Vermont	6,582	.2	.2	.1	.9	.5	2.0	.1	.1	.0	.2	.2
Virginia	94,351	.3	.4	.0	.1	.1	4.8	.0	.0	.4	.1	.1
Washington	79,663	.3	.4	5.5	5.2	15.1	23.7	7.1	9.3	.4	11.0	10.4
West Virginia	20,747	.1	.2	.0	.8	.8	9.0	.0	.0	.2	.0	.0
Wisconsin	67,450	.0	.4	.1	.1	.1	1.6	.0	.1	.0	9/ .1	.1
Wyoming	6,252	.0	.4	.0	1.1	1.1	2.1	.0	.0	.2	.0	.0
Puerto Rico	60,412	.0	.2	.0	.0	.0	.1	.0	.1	.0	.1	.1
Virgin Islands	1,800	.1	2.9	6.4	2.3	2.3	9.8	2.5	7.4	3.0	8.7	6.8
Guam	4,318	.1	1.3	5.4	1.1	1.3	4.0	1.9	2.9	1.3	5.7	5.5
American Samoa	1,688	-	...	...	...	...	...	...	...	...	...	...
Northern Marianas	1,462	12.3	21.5	...	...	...	...	...	...	43.6	...	...

0.0 Quantity more than zero but less than 0.05.

--Data not available.

1/ Excludes data for Puerto Rico, Virgin Islands, Guam, American Samoa, and the Commonwealth of the Northern Marianas.

2/ California reports date last normal menses began but does not report clinical estimate of gestation.

3/ Kansas does not report Rh sensitization.

4/ New York city (but not New York State) reports tobacco use.

5/ Texas does not report genital herpes and uterine bleeding.

6/ Nebraska and Texas do not report birth injury.

7/ New York city does not report assisted ventilation less than 30 minutes and assisted ventilation of 30 minutes or more.

8/ Texas does not report anesthetic complications and fetal distress.

9/ Wisconsin does not report fetal alcohol syndrome.

Table B. Births by State of Occurrence and Residence for Births Occurring in the 50 States and the District of Columbia, 1998

Area	Occurrence	Residence
United States	3,945,192	3,941,553
Alabama	61,209	62,074
Alaska	9,832	9,926
Arizona	78,076	78,243
Arkansas	35,763	36,865
California	522,290	521,661
Colorado	59,816	59,577
Connecticut	43,669	43,820
Delaware	11,023	10,578
District of Columbia	15,138	7,686
Florida	195,734	195,637
Georgia	123,262	122,368
Hawaii	17,619	17,583
Idaho	18,959	19,391
Illinois	179,462	182,588
Indiana	85,176	85,122
Iowa	37,433	37,282
Kansas	37,450	38,422
Kentucky	52,880	54,329
Louisiana	67,100	66,888
Maine	13,530	13,733
Maryland	67,408	71,972
Massachusetts	82,216	81,411
Michigan	132,443	133,666
Minnesota	65,094	65,202
Mississippi	41,942	42,939
Missouri	77,701	75,358
Montana	10,742	10,795
Nebraska	23,915	23,534
Nevada	28,218	28,699
New Hampshire	13,933	14,429
New Jersey	111,709	114,550
New Mexico	26,960	27,318
New York State only	135,408	138,296
New York City only	124,240	119,911
North Carolina	112,785	111,688
North Dakota	9,156	7,932
Ohio	153,400	152,794
Oklahoma	48,449	49,461
Oregon	46,278	45,273
Pennsylvania	146,465	145,899
Rhode Island	13,489	12,599
South Carolina	51,701	53,877
South Dakota	10,391	10,288
Tennessee	82,412	77,396
Texas	346,101	342,283
Utah	46,128	45,165
Vermont	6,257	6,582
Virginia	92,021	94,351
Washington	78,980	79,663
West Virginia	21,574	20,747
Wisconsin	66,421	67,450
Wyoming	5,834	6,252
Foreign Residents	-	3,639
Puerto Rico	-	21
Virgin Islands	-	19
Guam	-	4
American Samoa	-	-
Northern Marianas	-	-
Canada	-	111
Cuba	-	2
Mexico	-	2,818
Remainder of world	-	664

- Quantity zero.

Table C. Lower and upper 95 percent confidence limit factors for a birth rate based on a Poisson variable of 1-99 births

Number of births	L	U	Number of births	L	U
1	0.02532	5.57164	51	0.74457	1.31482
2	0.12110	3.61234	52	0.74685	1.31137
3	0.20622	2.92242	53	0.74907	1.30802
4	0.27247	2.56040	54	0.75123	1.30478
5	0.32470	2.33367	55	0.75334	1.30164
6	0.36698	2.17658	56	0.75539	1.29858
7	0.40205	2.06038	57	0.75739	1.29562
8	0.43173	1.97040	58	0.75934	1.29273
9	0.45726	1.89831	59	0.76125	1.28993
10	0.47954	1.83904	60	0.76311	1.28720
11	0.49920	1.78928	61	0.76492	1.28454
12	0.51671	1.74680	62	0.76669	1.28195
13	0.53246	1.71003	63	0.76843	1.27943
14	0.54671	1.67783	64	0.77012	1.27698
15	0.55969	1.64935	65	0.77178	1.27458
16	0.57159	1.62394	66	0.77340	1.27225
17	0.58254	1.60110	67	0.77499	1.26996
18	0.59266	1.58043	68	0.77654	1.26774
19	0.60207	1.56162	69	0.77806	1.26556
20	0.61083	1.54442	70	0.77955	1.26344
21	0.61902	1.52861	71	0.78101	1.26136
22	0.62669	1.51401	72	0.78244	1.25933
23	0.63391	1.50049	73	0.78384	1.25735
24	0.64072	1.48792	74	0.78522	1.25541
25	0.64715	1.47620	75	0.78656	1.25351
26	0.65323	1.46523	76	0.78789	1.25165
27	0.65901	1.45495	77	0.78918	1.24983
28	0.66449	1.44528	78	0.79046	1.24805
29	0.66972	1.43617	79	0.79171	1.24630
30	0.67470	1.42756	80	0.79294	1.24459
31	0.67945	1.41942	81	0.79414	1.24291
32	0.68400	1.41170	82	0.79533	1.24126
33	0.68835	1.40437	83	0.79649	1.23965
34	0.69253	1.39740	84	0.79764	1.23807
35	0.69654	1.39076	85	0.79876	1.23652
36	0.70039	1.38442	86	0.79987	1.23499
37	0.70409	1.37837	87	0.80096	1.23350
38	0.70766	1.37258	88	0.80203	1.23203
39	0.71110	1.36703	89	0.80308	1.23059
	0.71441	1.36172	90	0.80412	1.22917
	0.71762	1.35661	91	0.80514	1.22778
	0.72071	1.35171	92	0.80614	1.22641
	0.72370	1.34699	93	0.80713	1.22507
	0.72660	1.34245	94	0.80810	1.22375
	0.72941	1.33808	95	0.80906	1.22245
	0.73213	1.33386	96	0.81000	1.22117
	0.73476	1.32979	97	0.81093	1.21992
	0.73732	1.32585	98	0.81185	1.21868
	0.73981	1.32205	99	0.81275	1.21746
	0.74222	1.31838			

Table D. Sources for resident population and population including Armed Forces abroad: Birth- and death-registration States, 1900-1932, and United States, 1900-1998.

Year	Source
1998-----	U.S. Bureau of the Census, United States population estimates, by age, sex, race, and Hispanic origin: 1990 to 1998. Washington: U.S. Bureau of the Census. Internet release, June 4, 1999. Http://www.census.gov/population/www/estimates/uspop.html .
1997-----	U.S. Bureau of the Census, United States population estimates, by age, sex, race, and Hispanic origin: 1990 to 1997. PPL-91R. Rounded populations consistent with U.S. Bureau of the Census file NESTV97. Washington:U.S. Department of Commerce. 1998.
1996-----	U.S. Bureau of the Census, United States population estimates, by age, sex, race, and Hispanic origin: 1990 to 1996. PPL-57. Washington:U.S. Department of Commerce. 1997.
1995-----	U.S. Bureau of the Census, United States population estimates, by age, sex, race, and Hispanic origin: 1990 to 1995. Census file RESD0795, PPL-41. Washington:U.S. Department of Commerce. 1996.
1994-----	U.S. Bureau of the Census, United States population estimates, by age, sex, race, and Hispanic origin: 1990 to 1994. PPL-21. Washington:U.S. Department of Commerce. 1995.
1993-----	U.S. Bureau of the Census, United States population estimates, by age, sex, race, and Hispanic origin: 1993. Census file RESO793. Washington:U.S. Department of Commerce. 1995.
1992-----	U.S. Bureau of the Census, United States population estimates, by age, sex, race, and Hispanic origin: 1992. Census file RESPO792. Washington:U.S. Department of Commerce. 1994.
1991-----	U.S. Bureau of the Census, Unpublished data consistent with Current Population Reports, Series P-25, No. 1095, Feb. 1993.
1990-----	U.S. Bureau of the Census, Unpublished data from the 1990 census. 1990 CPH-L-74 and unpublished data consistent with Current Population Reports, Series P-25, No. 1095, Feb. 1993.
1989-----	U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 1057, Mar. 1990.
1988-----	U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 1045, Jan. 1990.
1986-87-----	U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 1022, Mar. 1988.
1985-----	U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 1000, Feb. 1987.
1984-----	U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 985, Apr. 1986.
1983-----	U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 965, Mar. 1985.
1982-----	U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 949, May 1984.
1981-----	U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 929, May 1983.
1980-----	U.S. Bureau of the Census, U.S. Census of Population: 1980, Number of Inhabitants, PC80-1-A1, United States Summary, 1983.
1971-79-----	U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 917, July 1982.
1970-----	U.S. Bureau of the Census, U.S. Census of Population: 1970, Number of Inhabitants, Final Report PC(1)-A1, United States Summary, 1971.
1961-69-----	U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 519, April 1974.
1960-----	U.S. Bureau of the Census, U.S. Census of Population: 1960, Number of Inhabitants, PC(1)-A1, United States Summary, 1964.
1951-59-----	U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 310, June 30, 1965.
1940-50-----	U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 499, May 1973.
1930-39-----	U.S. Bureau of the Census, Current Population Reports, Series P-25, No. 499, May 1973, and National Office of Vital Statistics, Vital Statistics Rates in the United States, 1900-1940, 1947.
1920-29-----	National Office of Vital Statistics, Vital Statistics Rates in the United States, 1900-1940, 1947.
1917-19-----	Same as for 1930-39.
1900-1916-----	Same as for 1920-29.

Table E. Ratio of census-level resident population to resident population adjusted for estimated net census undercount
by age, sex, and race: April 1, 1990

Age	Total			White			Black		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
All ages	0.9815	0.9721	0.9906	0.9802	0.9728	0.9873	0.9432	0.9151	0.9699
10-14	0.9882	0.9891	0.9873	0.9830	0.9841	0.9818	0.9591	0.9586	0.9595
15-19	1.0166	1.0198	1.0133	1.0094	1.0128	1.0059	0.9988	1.0016	0.9959
20-24	1.0002	0.9987	1.0017	0.9975	0.9985	0.9966	0.9593	0.9432	0.9753
25-29	0.9591	0.9439	0.9748	0.9558	0.9441	0.9681	0.9123	0.8732	0.9510
30-34	0.9687	0.9487	0.9892	0.9669	0.9518	0.9828	0.9129	0.8599	0.9651
35-39	0.9790	0.9628	0.9954	0.9764	0.9643	0.9888	0.9303	0.8808	0.9778
40-44	0.9901	0.9758	1.0044	0.9875	0.9764	0.9988	0.9410	0.8943	0.9850
45-49	0.9775	0.9633	0.9916	0.9762	0.9648	0.9877	0.9302	0.8807	0.9762
50-54	...	0.9623	...	...	0.9651	...	...	0.8802	...
55 years and over	...	0.9758	...	...	0.9783	...	...	0.9294	...
15-44	...	...	0.9954	...	...	0.9890	...	...	0.9739
15-54	...	0.9710	...	...	0.9710	...	...	0.9046	...

... Category not applicable.

Table 4-1. Population of Birth- and Death-Registration States, 1990-1932, and United States, 1900-1998

(Population enumerated as of April 1 for 1940, 1950, 1960, 1970, 1980 and 1990 and estimated as of July 1 for all other years)

Year	United States/1		Year	United States/1		Birth-registration States		Death-registration States	
	Population including Armed Forces abroad	Population residing in area		Population including Armed Forces abroad	Population residing in area	Number of States/2	Population residing in area	Number of States/2	Population residing in area
1998	270,509,187	270,298,524	1950	151,132,000	150,697,361	...	...	...	...
1997	267,901,000	267,636,061	1949	149,188,000	148,665,000	...	...	...	...
1996	265,556,890	265,283,783	1948	146,631,000	146,093,000	...	...	...	...
1995	263,033,968	262,755,270	1947	144,126,000	143,446,000	...	...	...	...
1994	260,659,690	260,340,990	1946	141,389,000	140,054,000	...	...	...	...
1993	258,119,768	257,783,004	1945	139,928,000	132,481,000	...	...	...	...
1992	255,457,501	255,077,536	1944	138,397,000	132,885,000	...	...	...	...
1991	252,688,000	252,177,000	1943	136,739,000	134,245,000	...	...	...	...
1990	249,225,000	248,709,873	1942	134,860,000	133,920,000	...	...	...	...
1989	247,342,000	246,819,000	1941	133,402,000	133,121,000	...	...	...	...
1988	245,021,000	244,499,000	1940	131,820,000	131,669,275	...	...	...	...
1987	242,804,000	242,289,000	1939	131,028,000	130,879,718	...	...	...	...
1986	240,651,000	240,133,000	1938	129,969,000	129,824,939	...	...	...	...
1985	238,466,000	237,924,000	1937	128,961,000	128,824,829	...	...	...	...
1984	236,348,000	235,825,000	1936	128,181,000	128,053,180	...	...	...	...
1983	234,307,000	233,792,000	1935	127,362,000	127,250,232	...	...	...	...
1982	232,188,000	231,664,000	1934	126,485,000	126,373,773	...	...	...	...
1981	229,966,000	229,466,000	1933	125,690,000	125,578,763	...	...	...	...
1980	227,061,000	226,545,805	1932	124,949,000	124,840,471	47	118,903,899	47	118,903,899
1979	225,055,000	224,567,000	1931	124,149,000	124,039,648	46	117,455,229	47	118,148,987
1978	222,585,000	222,095,000	1930	123,188,000	123,076,741	46	116,544,946	47	117,238,278
1977	220,239,000	219,760,000	1929	---	121,769,939	46	115,317,450	46	115,317,450
1976	218,035,000	217,563,000	1928	---	120,501,115	44	113,636,160	44	113,636,160
1975	215,973,000	215,465,000	1927	---	119,038,062	40	104,320,830	42	107,084,532
1974	213,854,000	213,342,000	1926	---	117,399,225	35	90,400,590	41	103,822,683
1973	211,909,000	211,357,000	1925	---	115,831,963	33	88,294,564	40	102,031,555
1972	209,896,000	209,284,000	1924	---	114,113,463	33	87,000,295	39	99,318,098
1971	207,661,000	206,827,000	1923	---	111,949,945	30	81,072,123	38	96,788,197
1970	204,270,000	203,211,926	1922	---	110,054,778	30	79,560,746	37	92,702,901
1969	202,677,000	201,385,000	1921	---	108,541,489	27	70,807,090	34	87,814,447
1968	200,706,000	199,399,000	1920	---	106,466,420	23	63,597,307	34	86,079,263
1967	198,712,000	197,457,000	1919	105,063,000	104,512,110	22	61,212,076	33	83,157,982
1966	196,560,000	195,576,000	1918	104,550,000	103,202,801	20	55,153,782	30	79,008,412
1965	194,303,000	193,526,000	1917	103,414,000	103,265,913	20	55,197,952	27	70,234,775
1964	191,889,000	191,141,000	1916	---	101,965,984	11	32,944,013	26	66,971,177
1963	189,242,000	188,483,000	1915	---	100,549,013	10	31,096,697	24	61,894,847
1962	186,538,000	185,771,000	1914	---	99,117,567	...	...	24	60,963,309
1961	183,691,000	182,992,000	1913	---	97,226,814	...	...	23	58,156,740
1960	179,933,000	179,323,175	1912	---	95,331,300	...	...	22	54,847,700
1959	177,264,000	176,513,000	1911	---	93,867,814	...	...	22	53,929,644
1958	174,141,000	173,320,000	1910	---	92,406,536	...	...	20	47,470,437
1957	171,274,000	170,371,000	1909	---	90,491,525	...	...	18	44,223,513
1956	168,221,000	167,306,000	1908	---	88,708,976	...	...	17	38,634,759
1955	165,275,000	164,308,000	1907	---	87,000,271	...	...	15	34,552,837
1954	162,391,000	161,164,000	1906	---	85,436,556	...	...	15	33,782,288
1953	159,565,000	158,242,000	1905	---	83,819,666	...	...	10	21,767,980
1952	156,954,000	155,687,000	1904	---	82,164,974	...	...	10	21,332,076
1951	154,287,000	153,310,000	1903	---	80,632,152	...	...	10	20,943,222
			1902	---	79,160,196	...	...	10	20,582,907
			1901	---	77,585,128	...	...	10	20,237,453
			1900	---	76,094,134	...	...	10	19,965,446

... Category not applicable

1/Alaska included beginning 1959 and Hawaii, 1960.

2/The District of Columbia is not included in "Number of States," but it is represented in all data shown for each year.

SOURCE: Published and unpublished data from the U.S. Bureau of the Census; see text.

Table 4-2. Estimated Population of the United States, by Age, Race, and Sex: July 1, 1998

[Figures include Armed Forces stationed in the United States but exclude those stationed outside the United States.]

Age	All races			White			Black			American Indian			Asian or Pacific Islander		
	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female	Both sexes	Male	Female
All ages	270,298,524	132,046,327	138,252,197	223,000,729	109,489,380	113,511,349	47,297,795	22,556,947	24,740,848	34,430,569	16,340,144	18,090,425	2,359,946	1,168,063	1,191,883
Under 1	3,776,389	1,929,312	1,847,077	2,993,441	1,532,601	1,460,840	782,948	396,711	386,237	560,713	284,257	276,456	40,887	20,523	20,364
1-4 years	15,189,749	7,766,906	7,422,843	12,058,700	6,179,436	5,879,264	3,131,049	1,587,470	1,543,579	2,266,865	1,149,017	1,117,848	158,834	80,347	78,487
5-9 years	19,920,862	10,195,027	9,725,835	15,686,897	8,038,094	7,648,803	4,233,965	2,156,933	2,077,032	3,170,130	1,609,577	1,560,553	224,191	113,894	110,297
10-14 years	19,241,808	9,854,788	9,387,020	15,202,008	7,799,351	7,402,657	4,039,800	2,055,437	1,984,363	2,992,945	1,520,299	1,472,646	243,014	123,463	119,551
15-19 years	19,539,327	10,045,566	9,493,761	15,492,233	7,991,575	7,500,658	4,047,094	2,053,991	1,993,103	3,024,366	1,537,293	1,487,073	228,853	115,032	113,821
15-17 years	11,743,251	6,049,165	5,694,086	9,301,764	4,803,090	4,498,674	2,441,487	1,246,075	1,195,412	1,803,798	922,334	881,464	143,997	72,700	71,297
18-19 years	7,796,076	3,996,401	3,799,675	6,190,469	3,188,485	3,001,984	1,605,607	807,916	797,691	1,220,568	614,959	605,609	84,856	42,332	42,524
20-24 years	17,674,134	8,996,110	8,678,024	14,093,581	7,224,785	6,868,796	3,580,553	1,771,325	1,809,228	2,633,203	1,300,285	1,332,918	188,975	95,301	93,674
25-29 years	18,588,114	9,246,888	9,341,226	14,867,714	7,473,057	7,394,657	3,720,400	1,773,831	1,946,569	2,622,710	1,253,815	1,368,895	192,668	99,429	93,239
30-34 years	20,186,296	10,006,893	10,179,403	16,347,087	8,201,666	8,145,421	3,839,209	1,805,227	2,033,982	2,727,967	1,279,155	1,448,812	181,362	91,972	89,390
35-39 years	22,625,784	11,256,018	11,369,766	18,626,277	9,364,283	9,261,994	3,999,507	1,891,735	2,107,772	2,883,922	1,354,291	1,529,631	184,914	92,388	92,526
40-44 years	21,894,075	10,844,698	11,049,377	18,177,682	9,098,379	9,079,303	3,716,393	1,746,319	1,970,074	2,676,120	1,251,755	1,424,365	169,796	82,912	86,884
45-49 years	18,859,365	9,252,354	9,607,011	15,830,743	7,858,712	7,972,031	3,028,622	1,393,642	1,634,980	2,153,894	984,132	1,169,762	138,416	67,158	71,258
50-54 years	15,725,519	7,647,607	8,077,912	13,473,817	6,624,094	6,849,723	2,251,702	1,023,513	1,228,189	1,587,413	711,774	875,639	108,289	52,080	56,209
55-59 years	12,406,909	5,956,213	6,450,696	10,672,553	5,180,801	5,491,752	1,734,356	775,412	958,944	1,249,295	546,840	702,455	80,560	38,082	42,478
60-64 years	10,269,061	4,849,497	5,419,564	8,853,308	4,231,745	4,621,563	1,415,753	617,752	798,001	1,028,261	439,816	588,445	62,606	29,241	33,365
65-69 years	9,593,497	4,392,568	5,200,929	8,340,929	3,857,225	4,483,704	1,252,568	535,343	717,225	936,144	400,002	536,142	49,192	22,202	26,990
70-74 years	8,801,796	3,857,005	4,944,791	7,821,943	3,452,264	4,369,679	979,853	404,741	575,112	729,672	299,327	430,345	39,937	17,868	22,069
75-79 years	7,218,007	2,997,107	4,220,900	6,487,580	2,705,650	3,781,930	730,427	291,457	438,970	553,805	216,180	337,625	30,116	12,799	17,317
80-84 years	4,734,182	1,764,311	2,969,871	4,308,395	1,609,889	2,698,506	425,787	154,422	271,365	326,973	112,476	214,497	18,396	7,374	11,022
85 years +	4,053,650	1,187,459	2,866,191	3,665,841	1,065,773	2,600,068	387,809	121,686	266,123	306,171	89,853	216,318	18,940	5,998	12,942

SOURCE: Published and unpublished data from the U.S. Bureau of the Census; see text.

Table 4-3. Estimated Total Population and Female Population Aged 15-44 Years: United States, Each Division and State, Puerto Rico, Virgin Islands, Guam, American Samoa, and the Northern Marianas: July 1, 1998

[Figures include Armed Forces stationed in each area and exclude those stationed outside the United States.]

Area	Total	Female 15-44 years	Area	Total	Female 15-44 years
United States	270298524	60111557			
Geographic divisions:			South Atlantic		
New England	13,429,862	3,012,806	Delaware	743,603	172,819
Middle Atlantic	38,291,763	8,382,361	Maryland	5,134,808	1,196,880
East North Central	44,194,756	9,863,754	District of Columbia	523,124	126,426
West North Central	18,694,626	4,088,137	Virginia	6,791,345	1,597,037
South Atlantic	48,944,678	10,864,320	West Virginia	1,811,156	386,346
East South Central	16,471,211	3,718,882	North Carolina	7,546,493	1,677,166
West South Central	30,013,597	6,755,599	South Carolina	3,835,962	879,477
Mountain	16,813,233	3,681,878	Georgia	7,642,207	1,820,738
Pacific	43,444,798	9,743,820	Florida	14,915,980	3,007,431
New England			East South Central		
Maine	1,244,250	276,187	Kentucky	3,936,499	882,559
New Hampshire	1,185,048	275,914	Tennessee	5,430,621	1,225,736
Vermont	590,883	133,989	Alabama	4,351,999	981,633
Massachusetts	6,147,132	1,392,583	Mississippi	2,752,092	628,954
Rhode Island	988,480	218,934	West South Central		
Connecticut	3,274,069	715,199	Arkansas	2,538,303	545,749
Middle Atlantic			Louisiana	4,368,967	1,002,566
New York	18,175,301	4,038,534	Oklahoma	3,346,713	717,052
New Jersey	8,115,011	1,781,092	Texas	19,759,614	4,490,232
Pennsylvania	12,001,451	2,562,735	Mountain		
East North Central			Montana	880,453	182,845
Ohio	11,209,493	2,497,235	Idaho	1,228,684	268,122
Indiana	5,899,195	1,324,439	Wyoming	480,907	102,643
Illinois	12,045,326	2,675,096	Colorado	3,970,971	886,746
Michigan	9,817,242	2,213,708	New Mexico	1,736,931	378,533
Wisconsin	5,223,500	1,153,276	Arizona	4,668,631	1,000,352
West North Central			Utah	2,099,758	494,186
Minnesota	4,725,419	1,054,458	Nevada	1,746,898	368,451
Iowa	2,862,447	607,088	Pacific		
Missouri	5,438,559	1,198,407	Washington	5,689,263	1,279,008
North Dakota	638,244	136,091	Oregon	3,281,974	699,329
South Dakota	738,171	158,153	California	32,666,550	7,377,208
Nebraska	1,662,719	361,056	Alaska	614,010	135,809
Kansas	2,629,067	572,884	Hawaii	1,193,001	252,466
			Territories		
			Puerto Rico	3,857,070	904,668
			Virgin Islands	118,382	29,315
			Guam	149,101	31,057
			American Samoa	62,093	13,547
			Northern Marianas	66,611	22,483

Source: Published and unpublished data from the Bureau of the Census; see text.